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## Synthetic Approaches to Highly Functional beta-Carboline Building Blocks via Allylic Amidation

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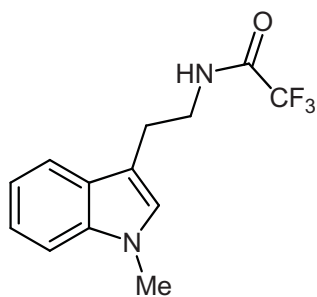
Supporting Information  
for DOI: 10.1055/s-0031-1289656  
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## Supporting Information

### Synthetic approaches to highly functional $\beta$ -carboline building blocks via allylic amidation

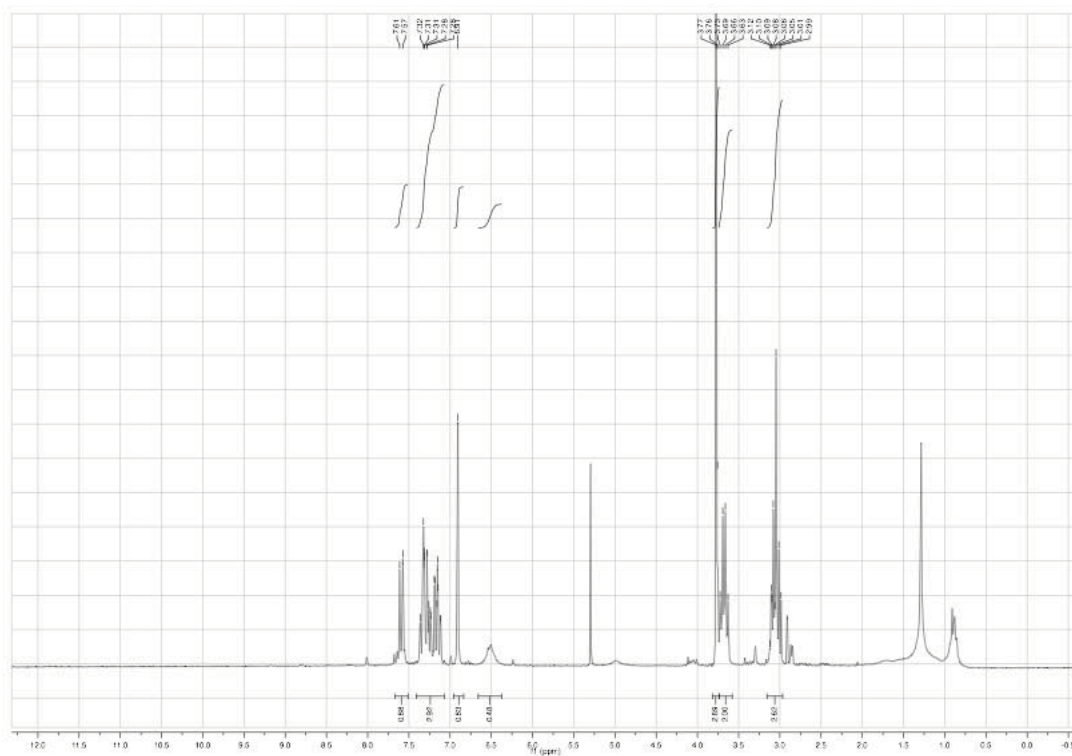
Johannes F. Teichert, Martín Fañanás-Mastral and Ben L. Feringa\*

NMR spectra:

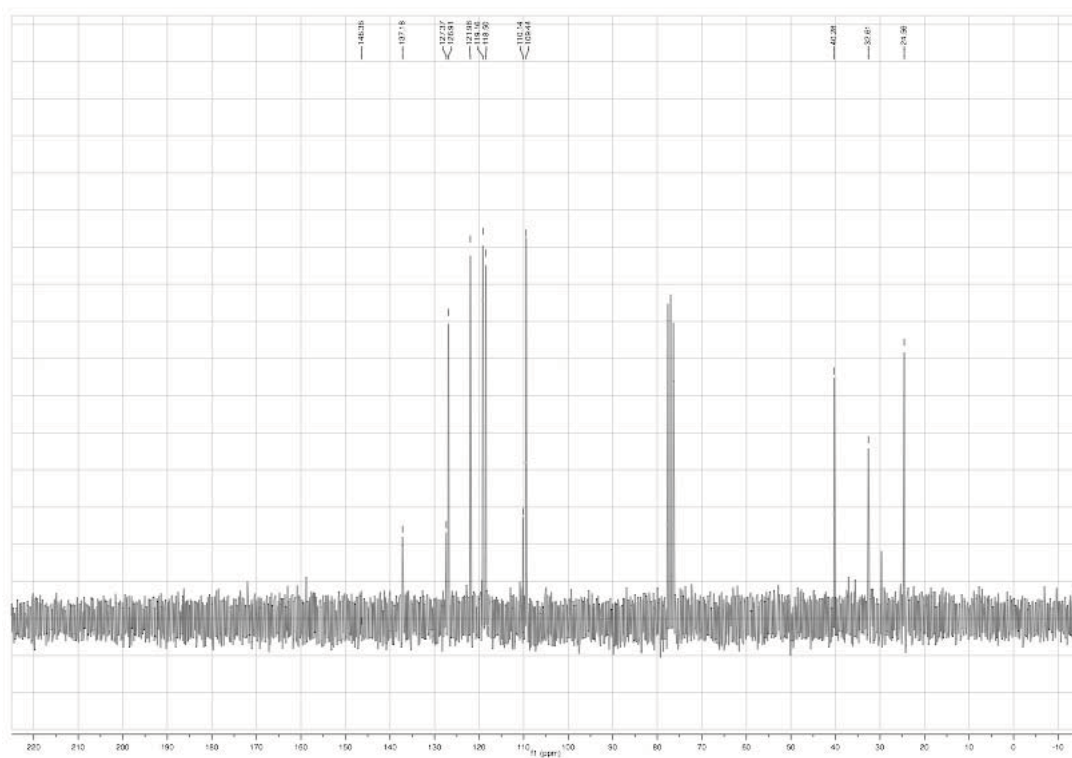


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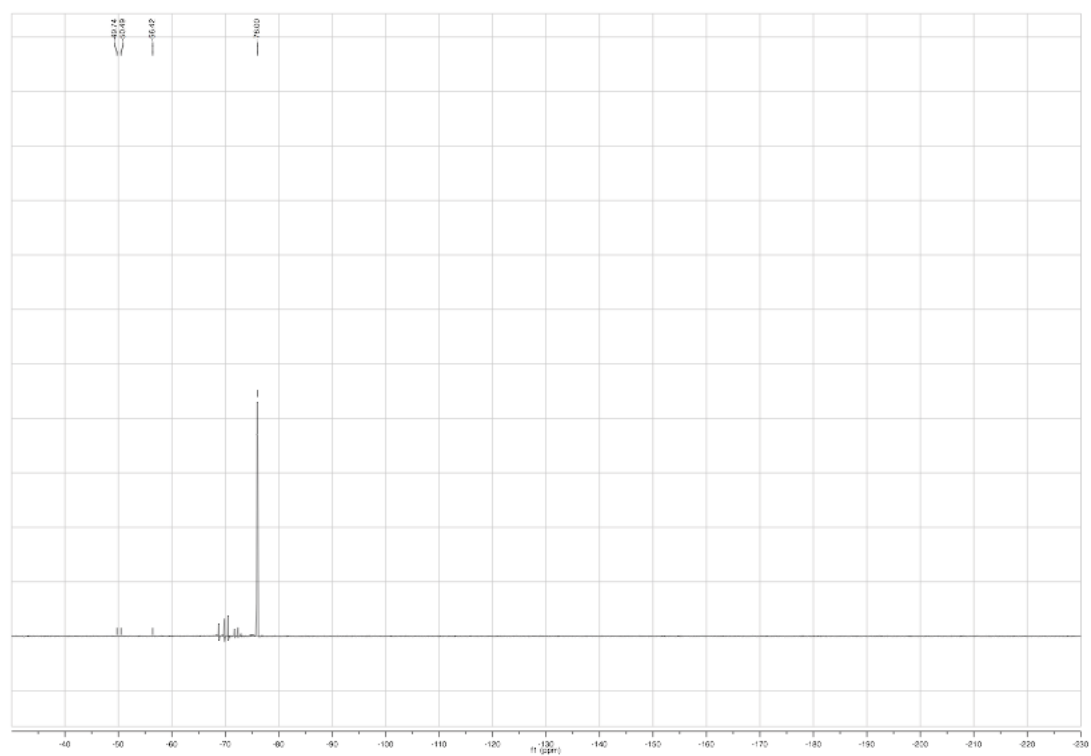
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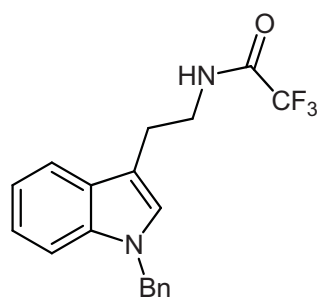


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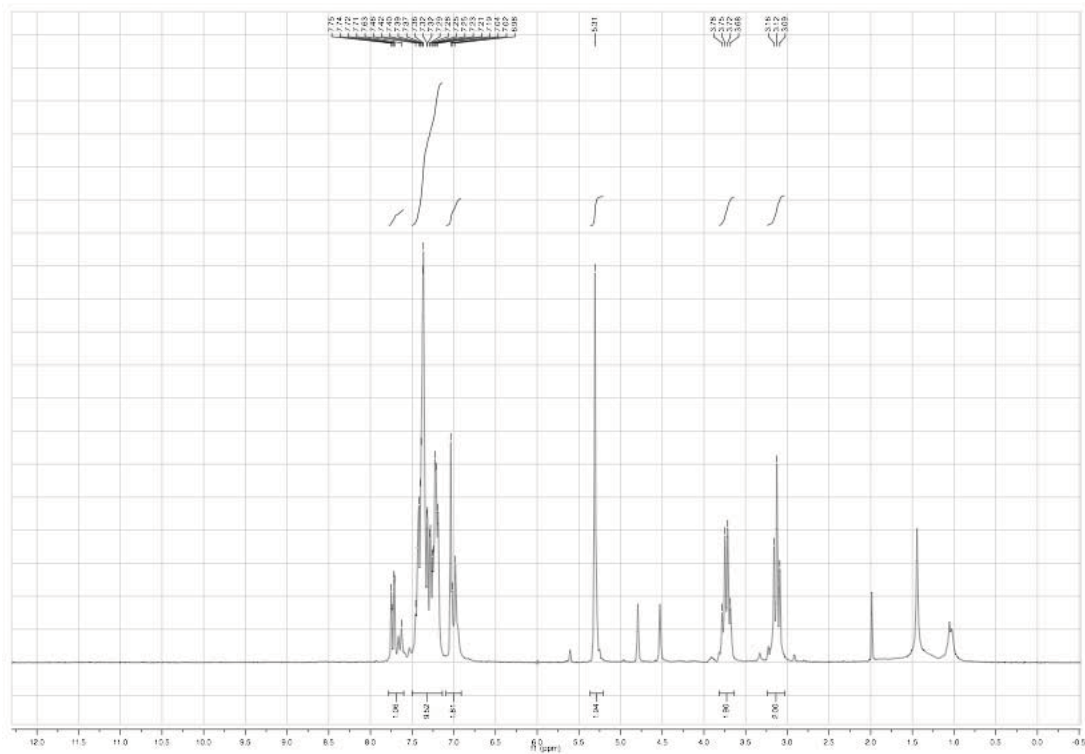
<sup>19</sup>F NMR:



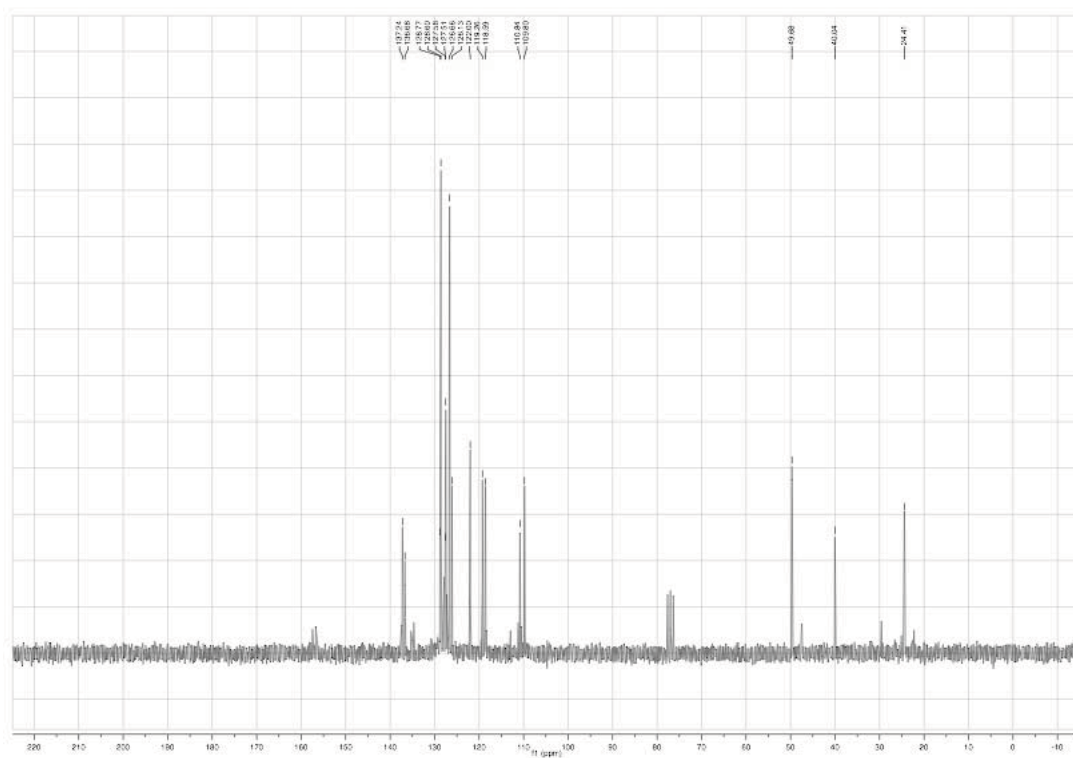


**3b**

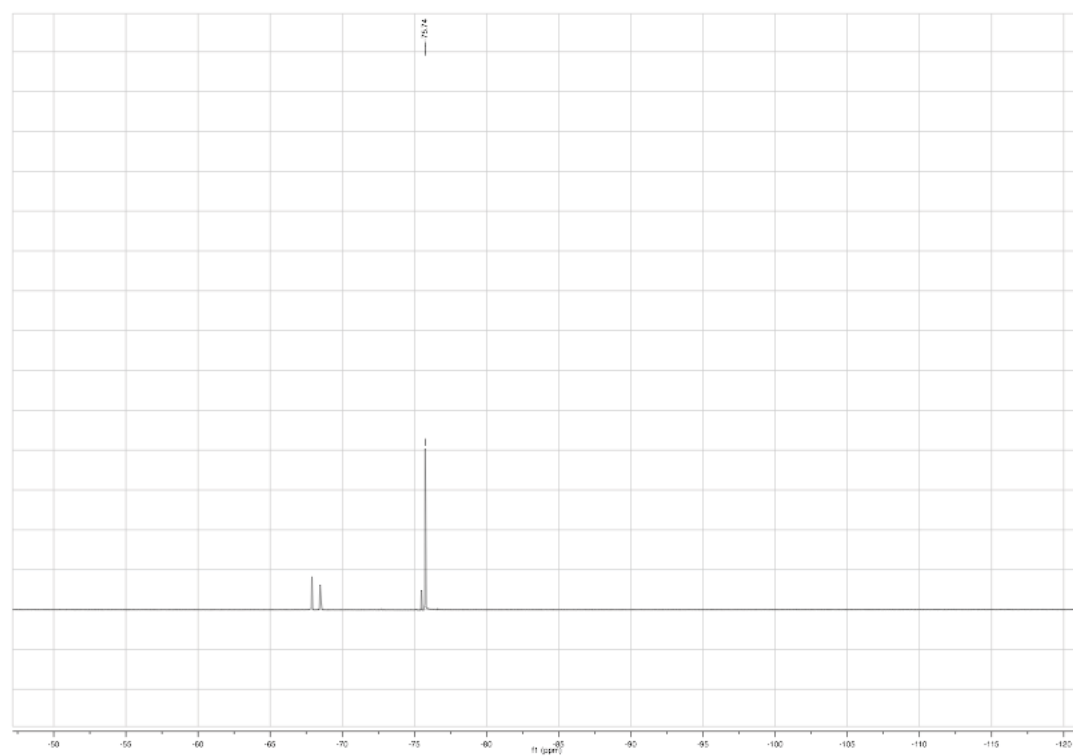
<sup>1</sup>H NMR:



<sup>13</sup>C NMR:



<sup>19</sup>F NMR:

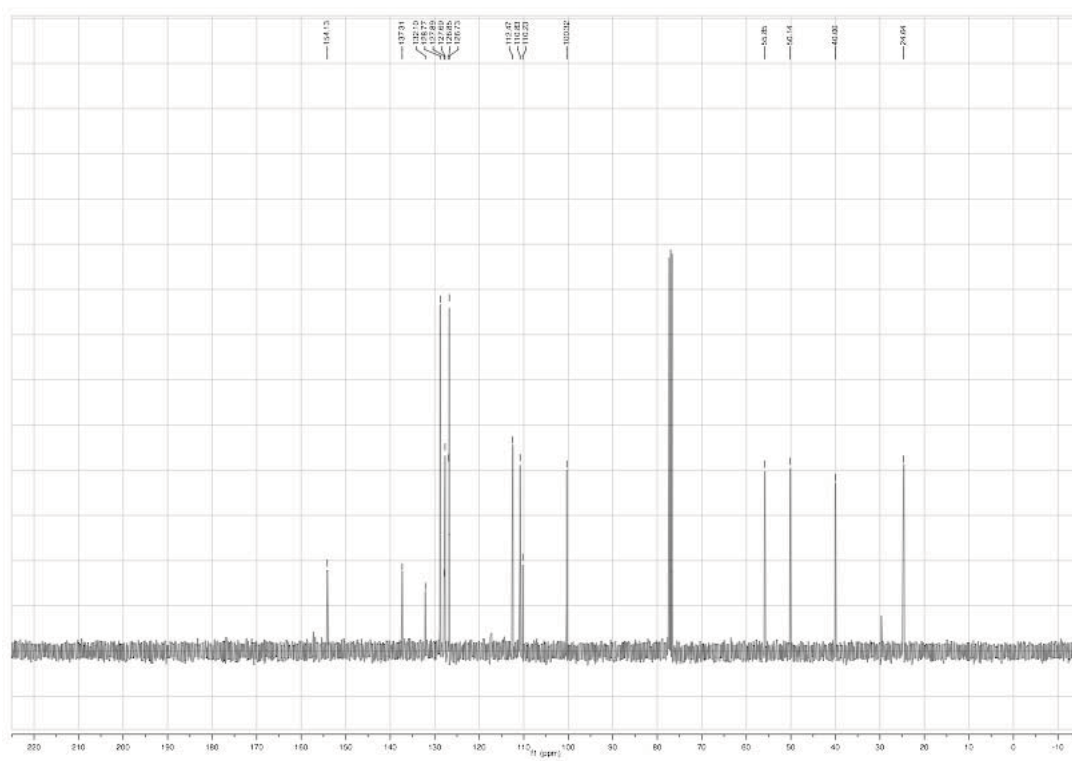




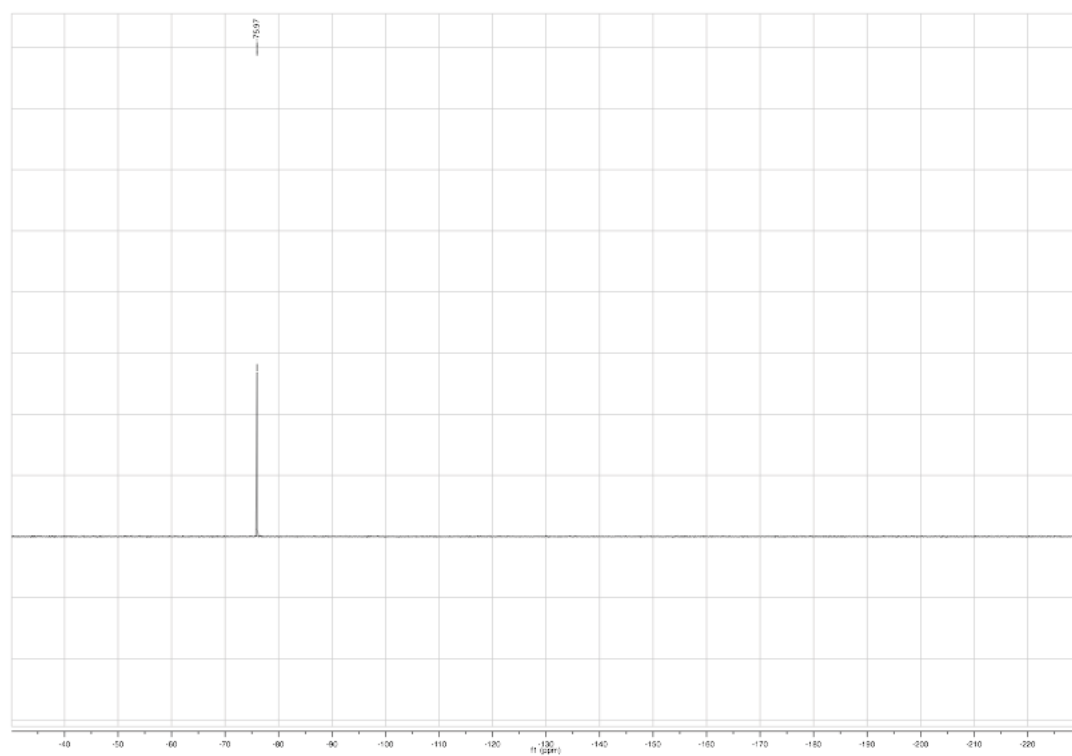
<sup>1</sup>H NMR spectrum of compound 6j in CDCl<sub>3</sub>. The x-axis represents chemical shift in ppm, ranging from 0 to 12. The spectrum shows several peaks corresponding to different proton environments in the molecule.

Chemical Shift (ppm)	Multiplicity	Integration
~7.3-7.4	multiplet	1.00, 0.95, 0.95, 0.95, 0.95, 0.95
~6.4	singlet	0.95
~5.1	doublet	1.00
~3.8	triplet	2.00
~3.6	quartet	2.00
~1.2	triplet	2.00

<sup>13</sup>C NMR:

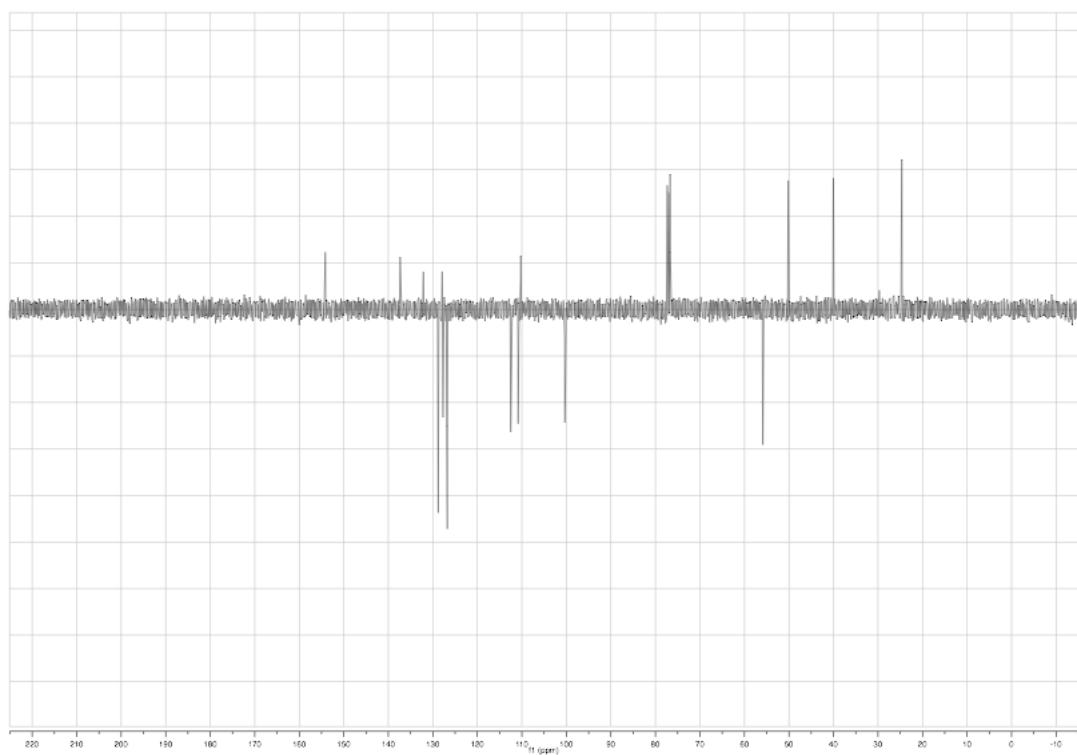


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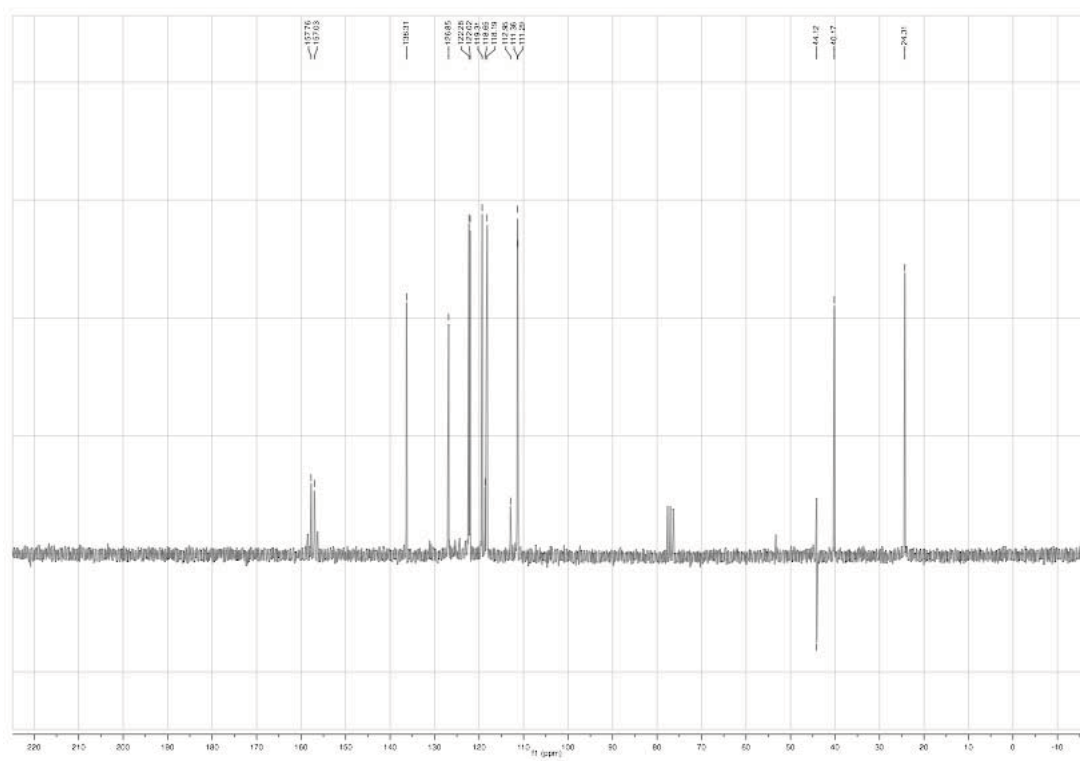


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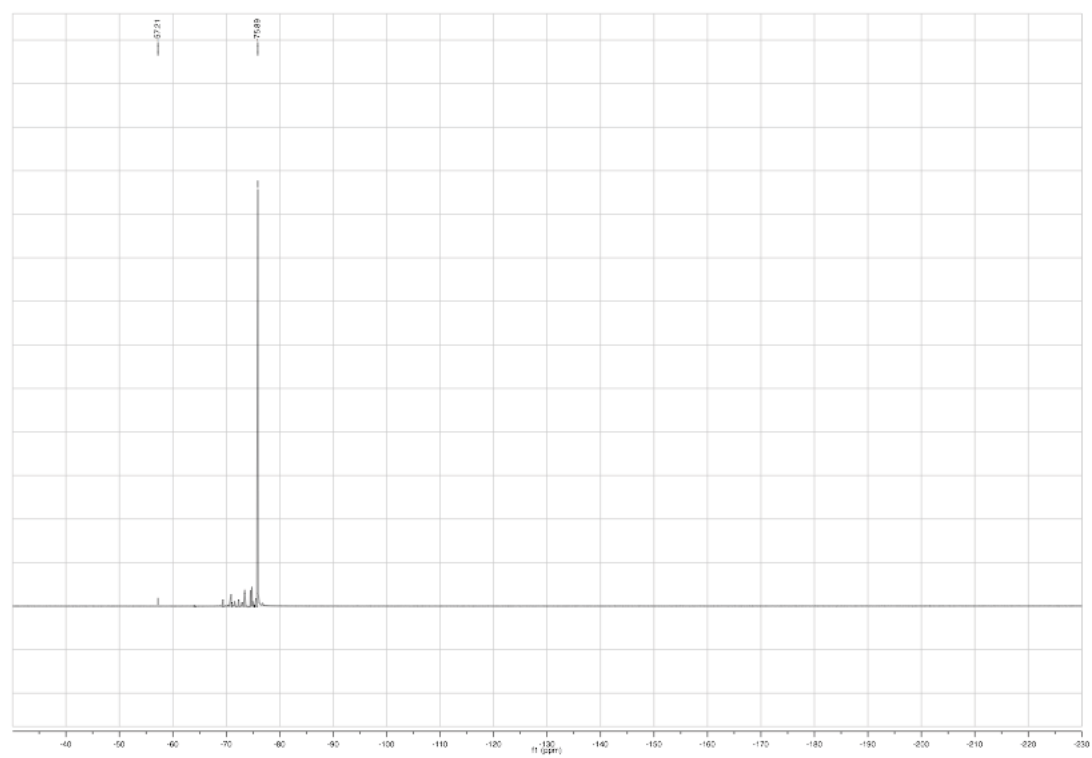




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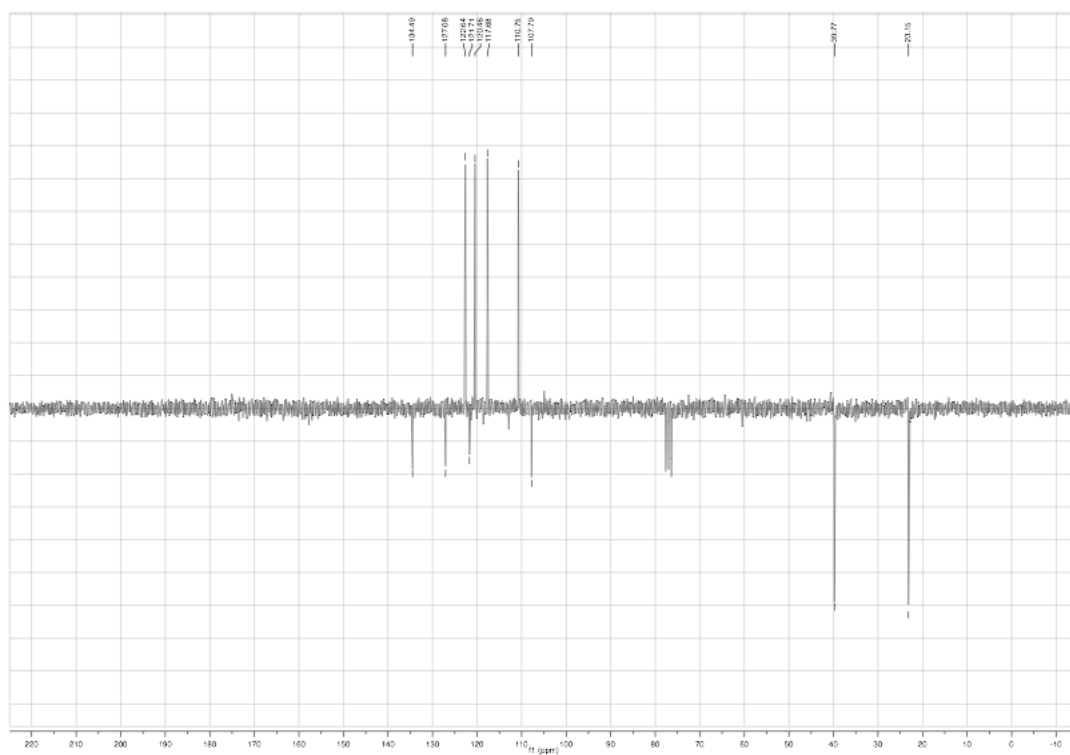


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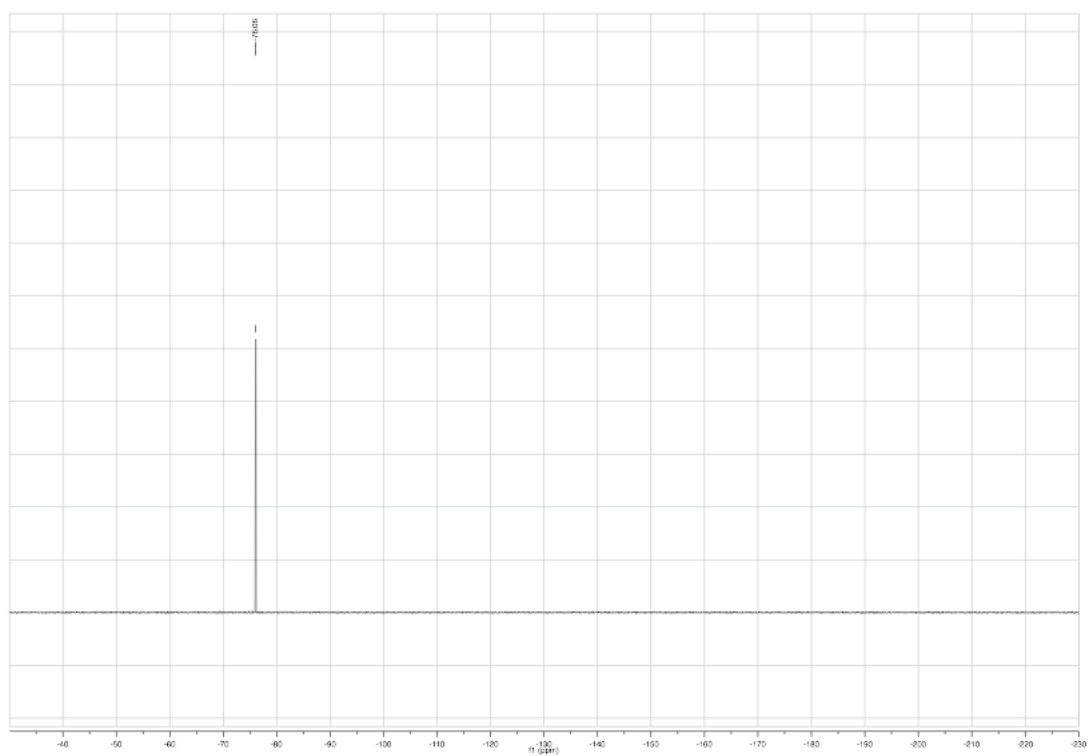


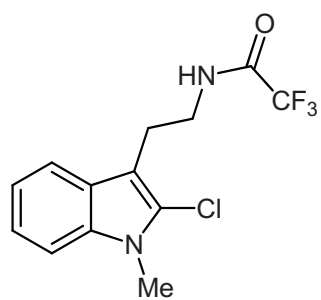


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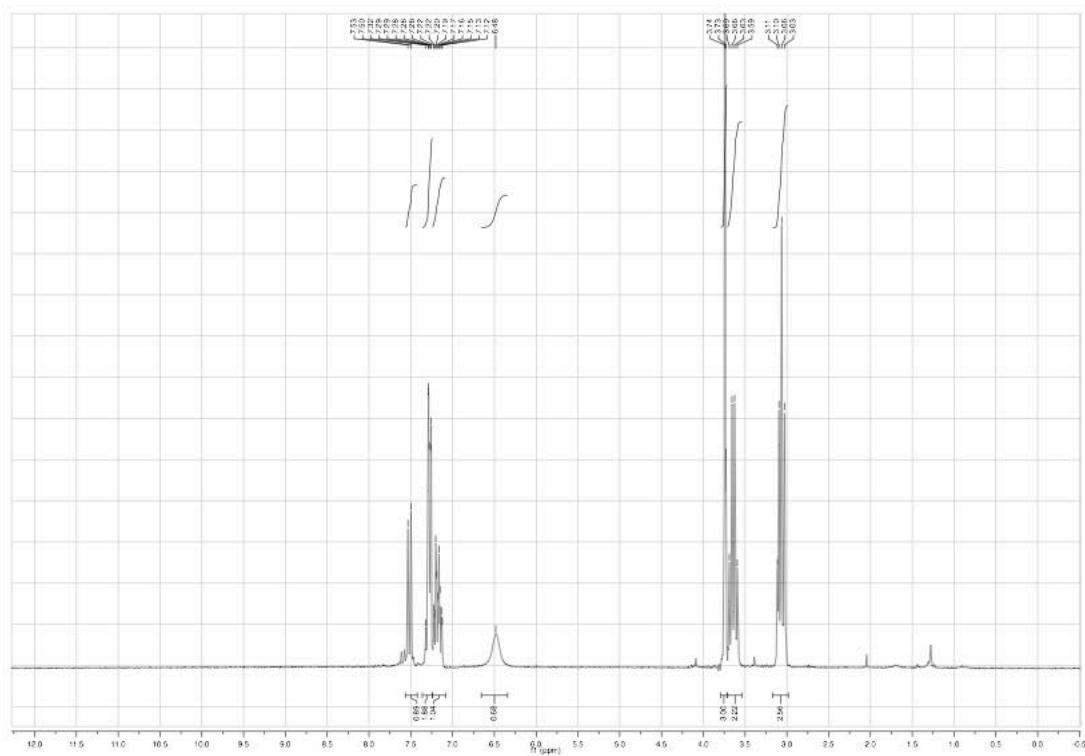
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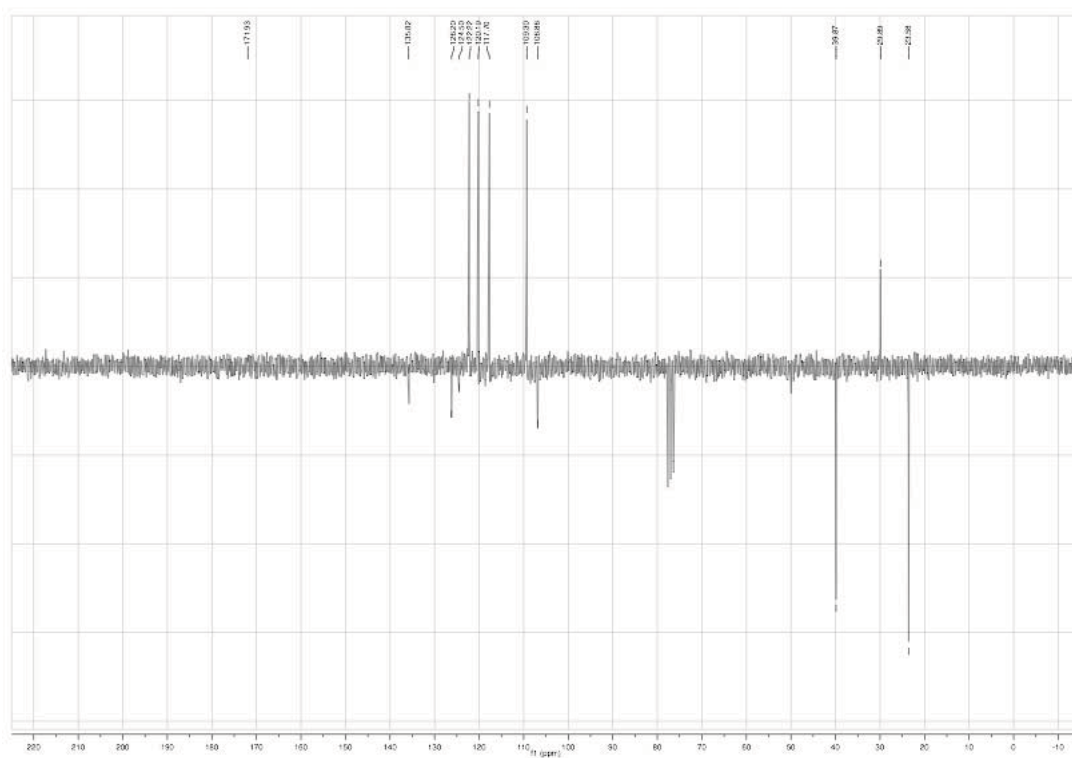


**5b**

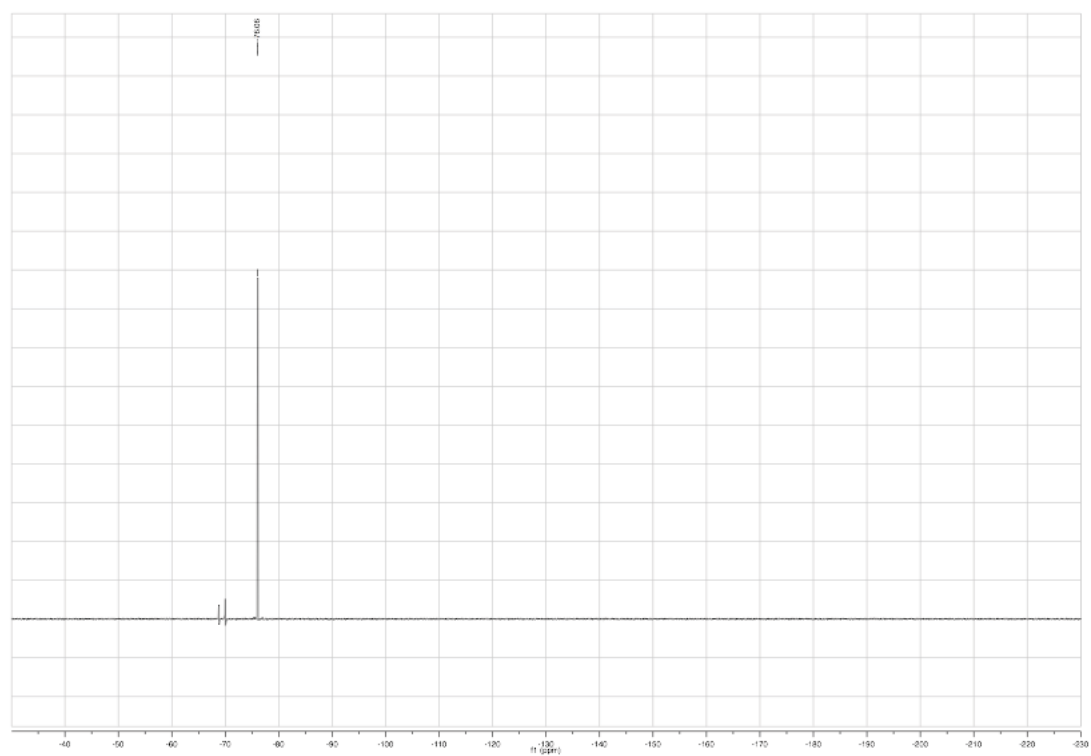
$^1\text{H}$  NMR:



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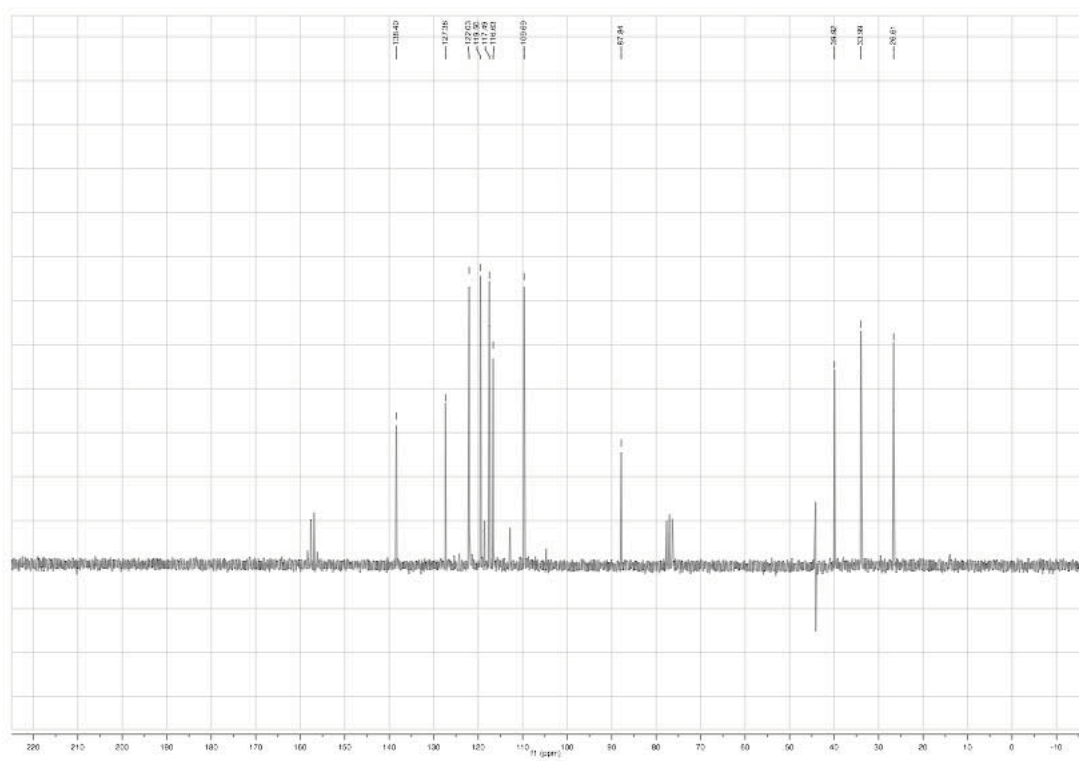


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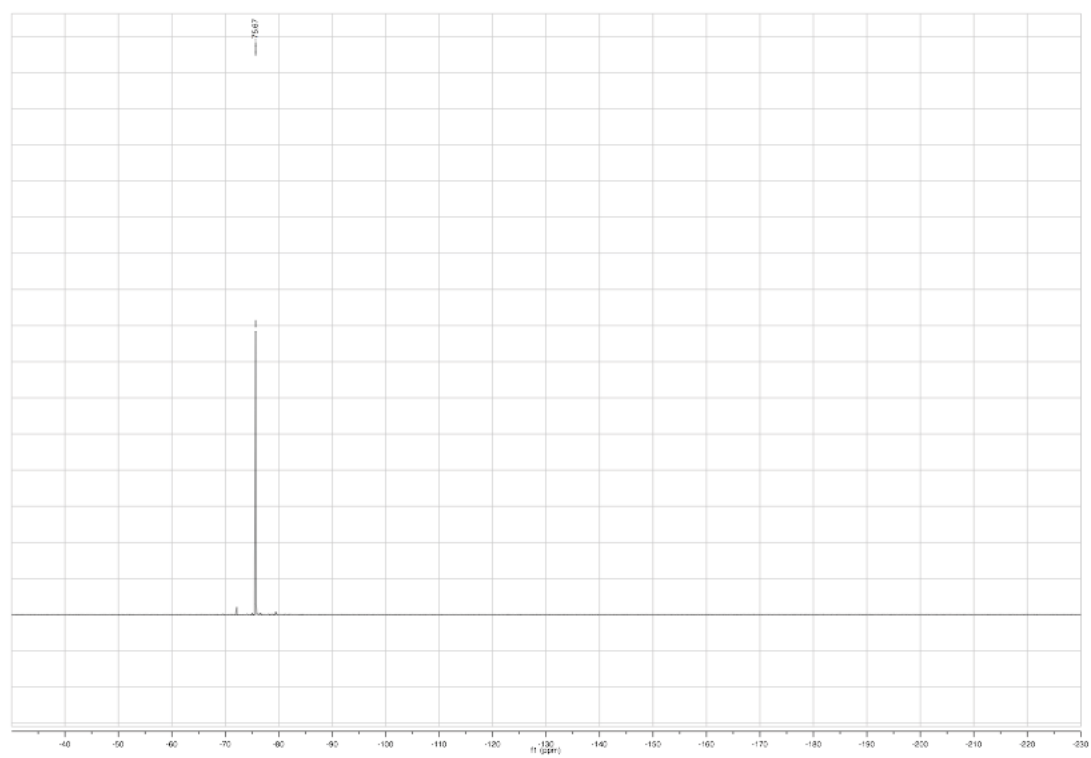


[illegible] $^{13}\text{C}$  NMR:

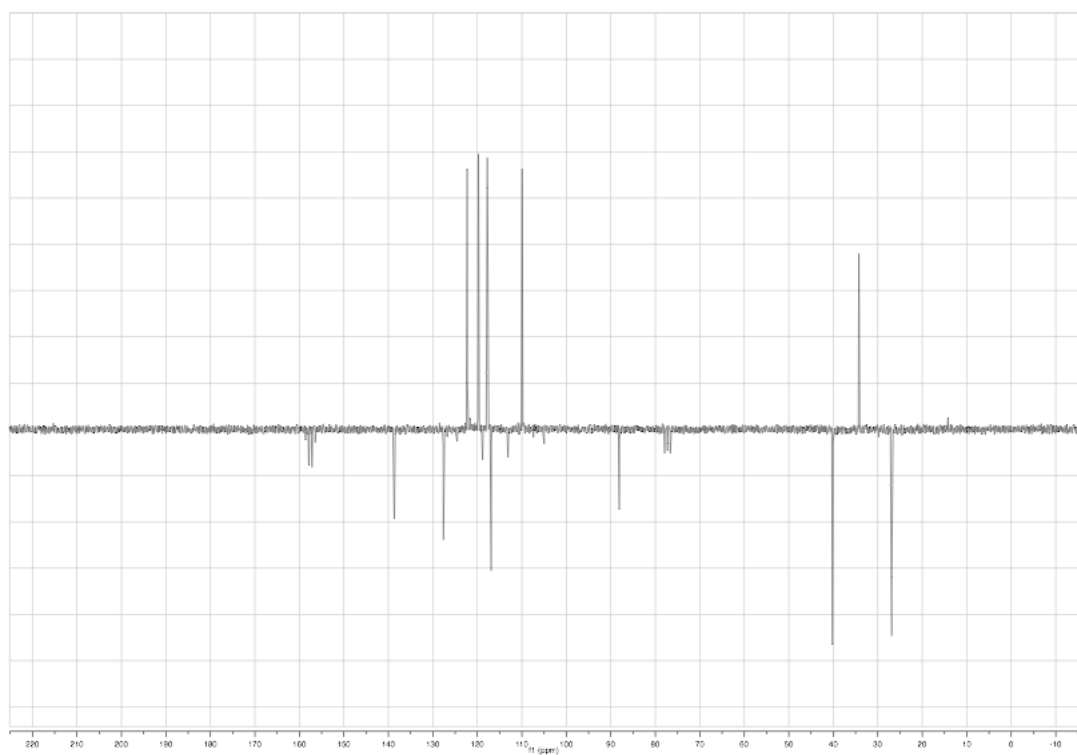




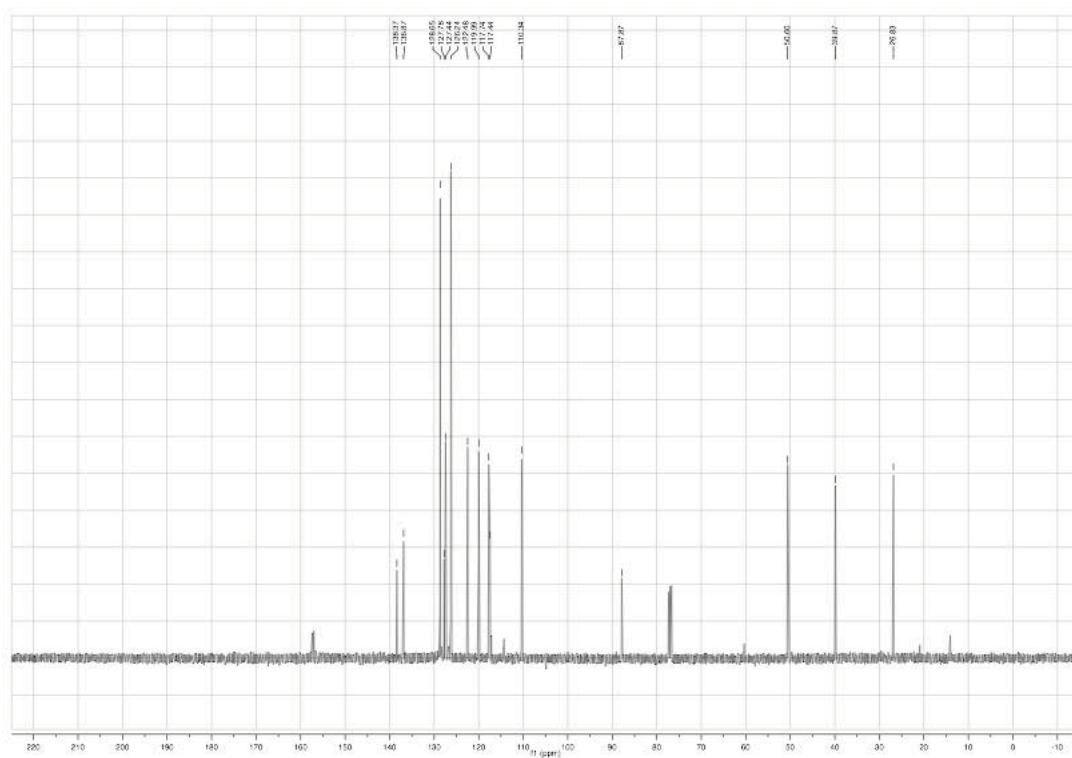
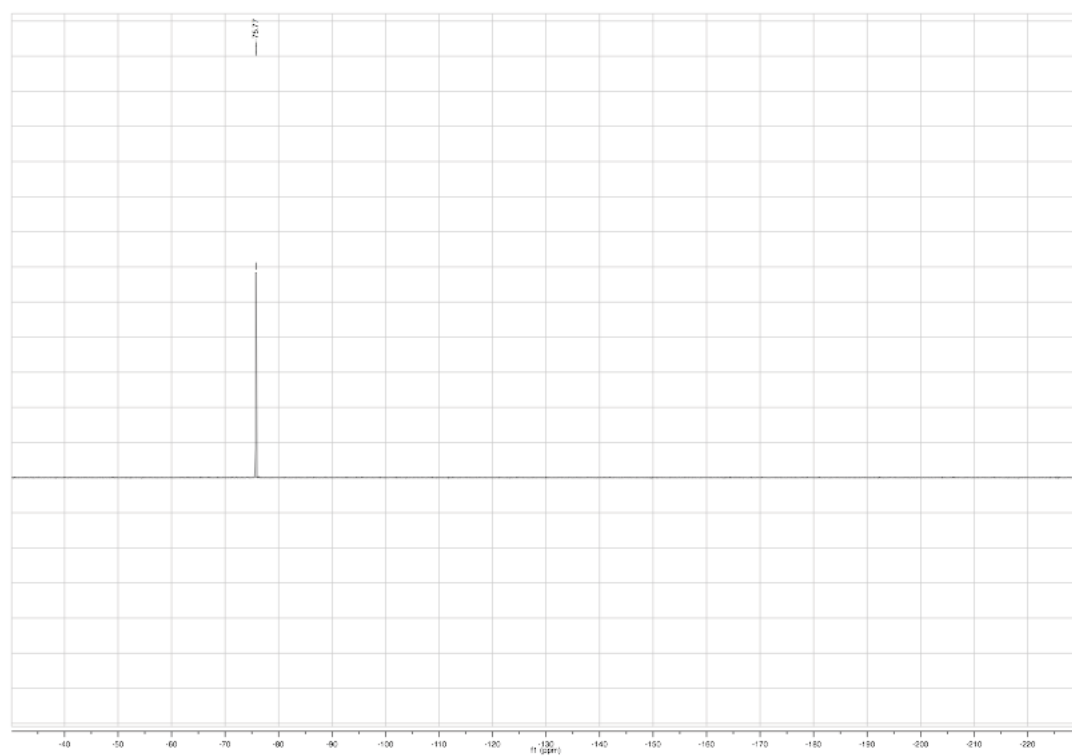
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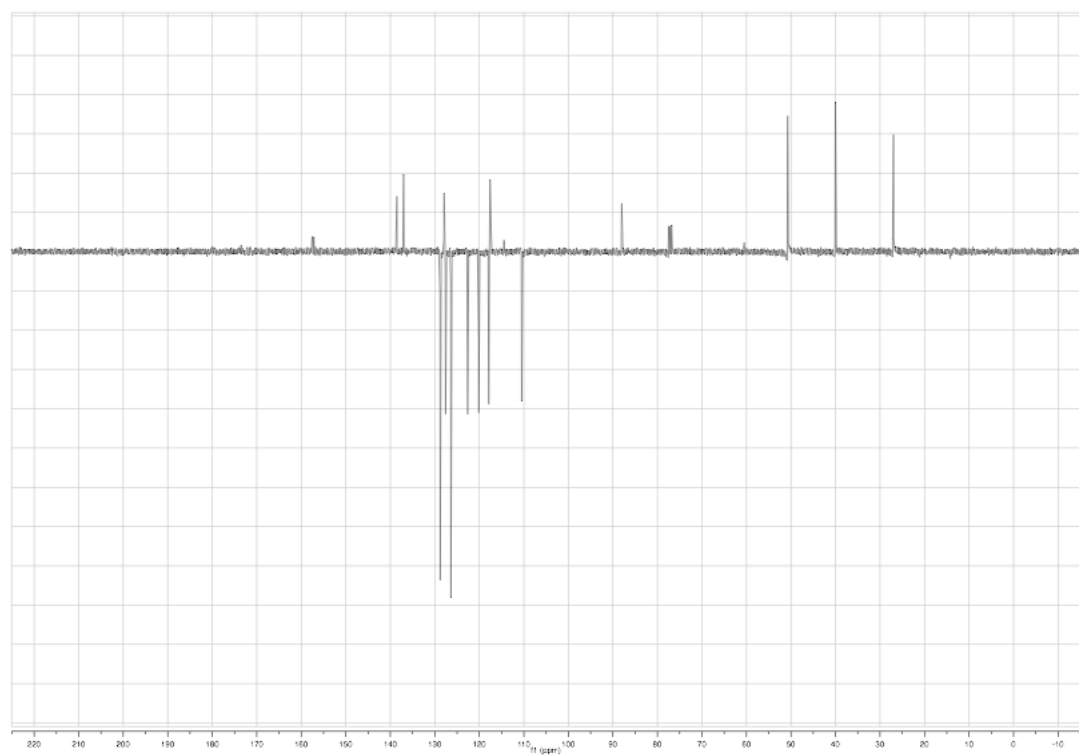
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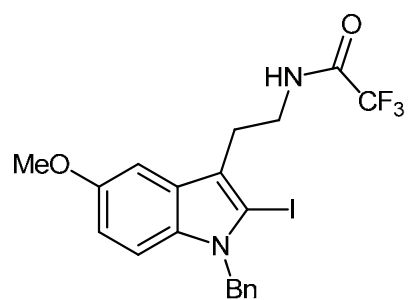


<sup>13</sup>C NMR:

<sup>19</sup>F NMR:

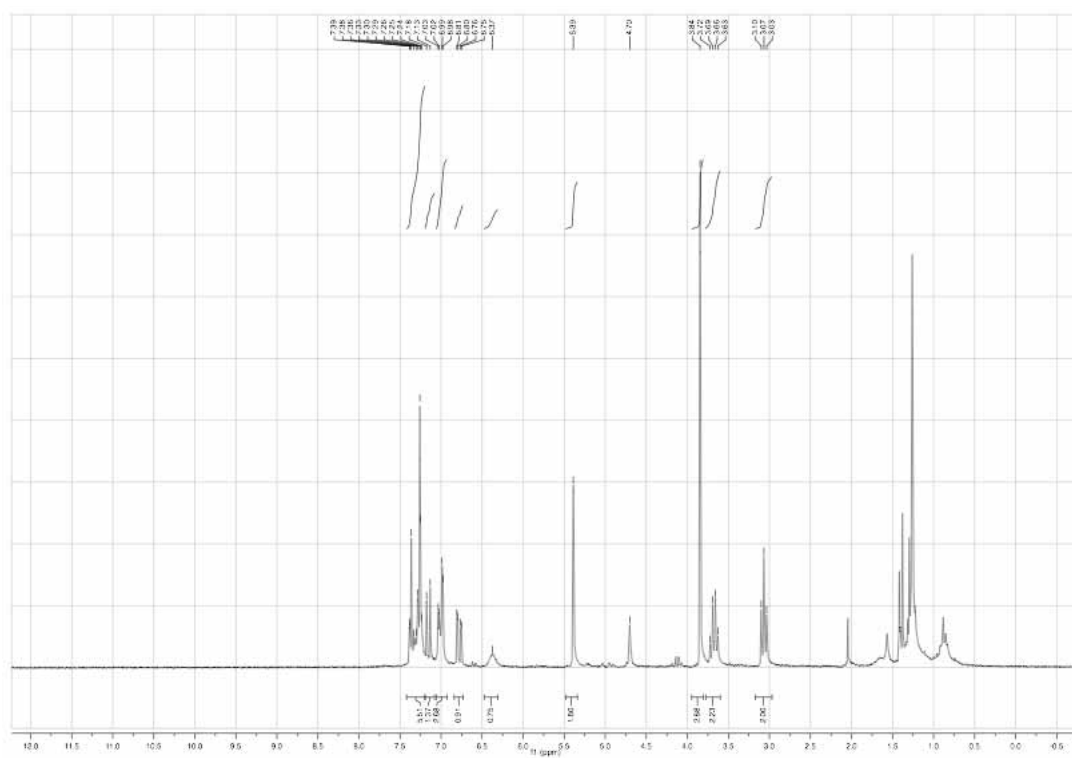
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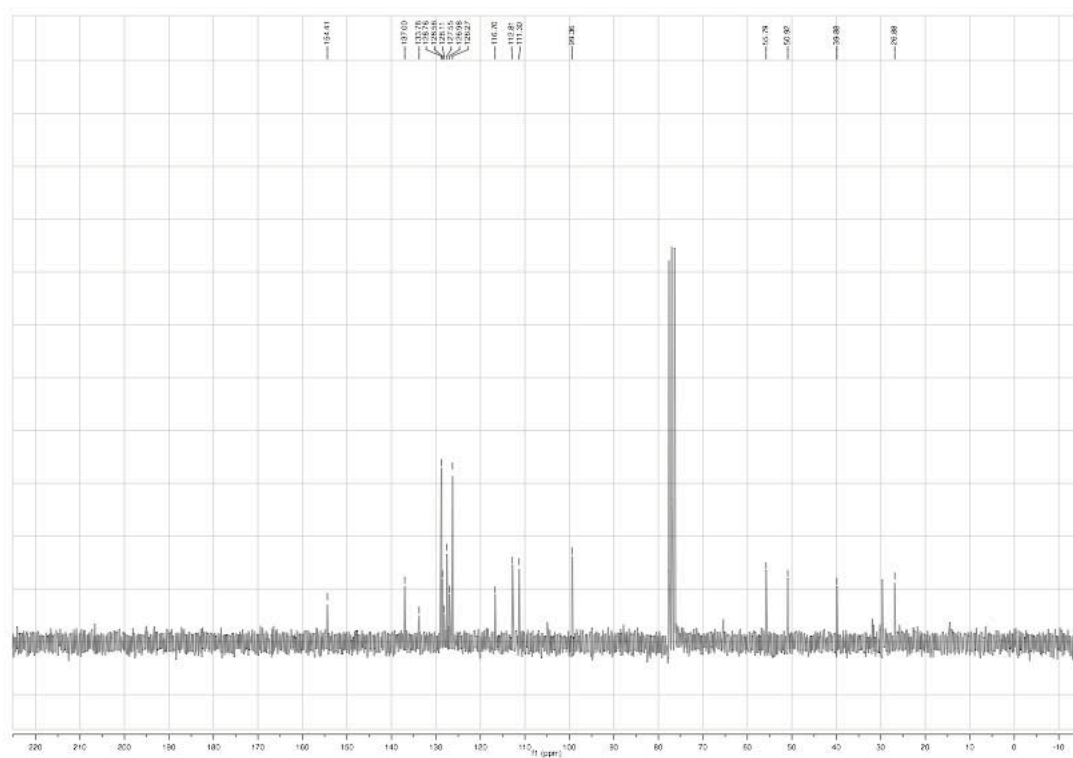


**7c**

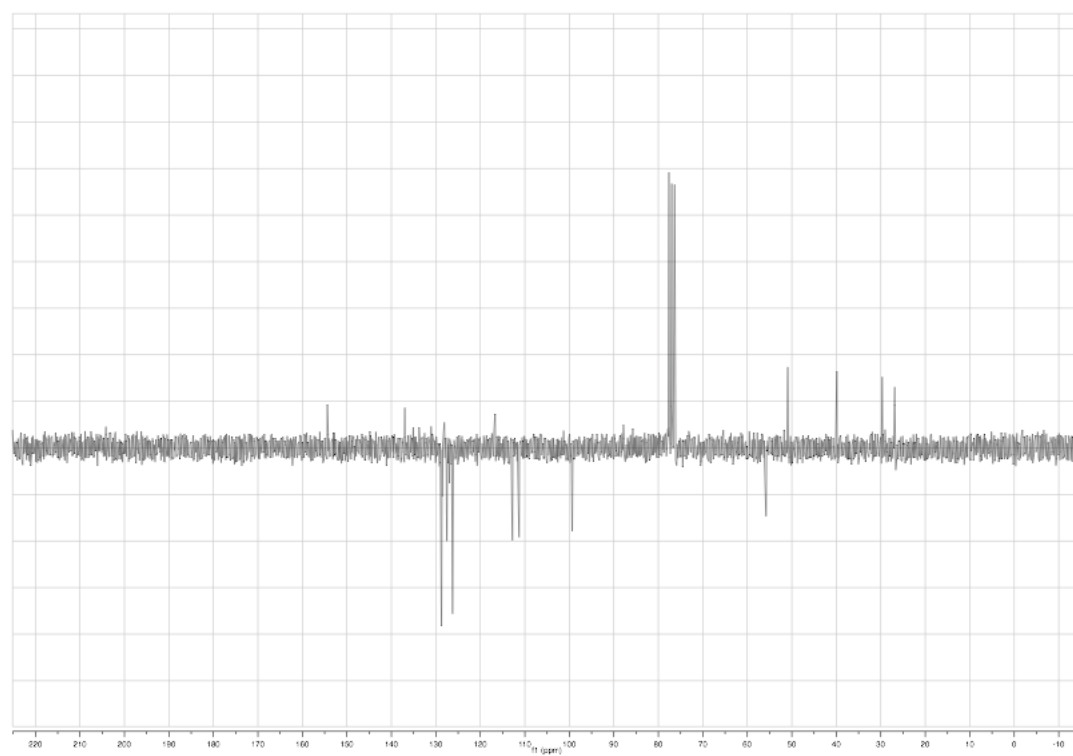
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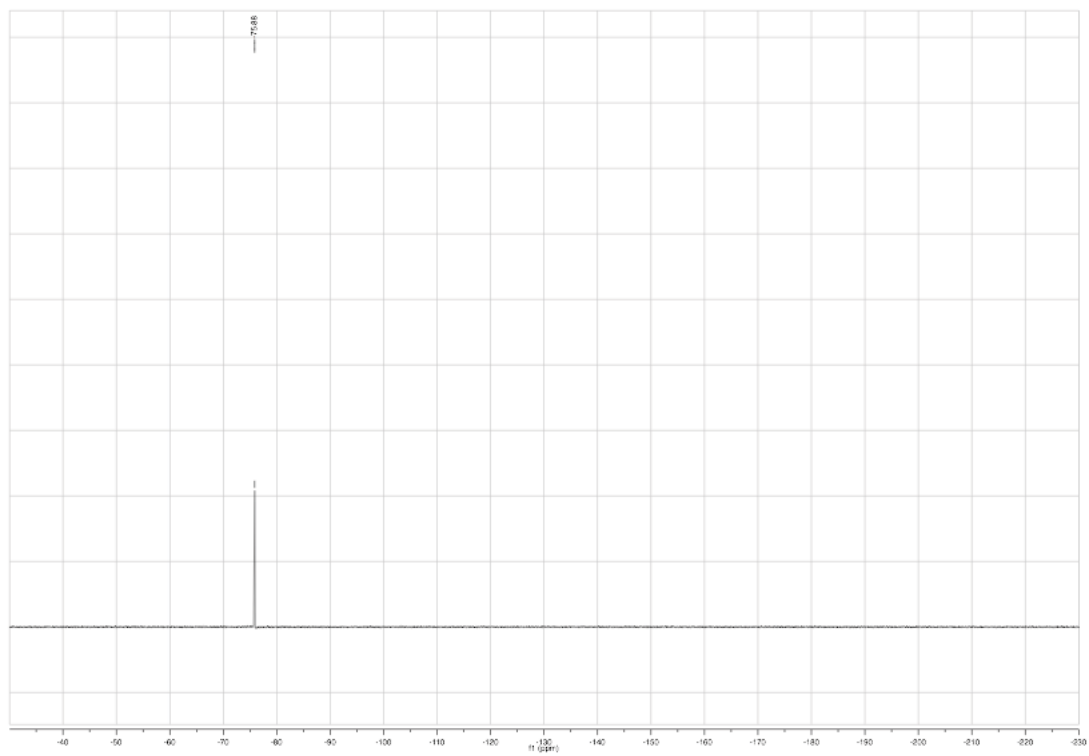
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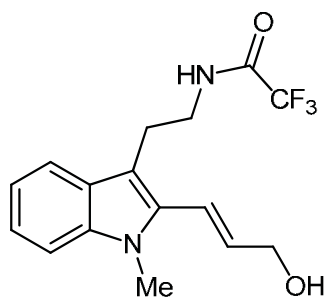
APT:



<sup>19</sup>F NMR:

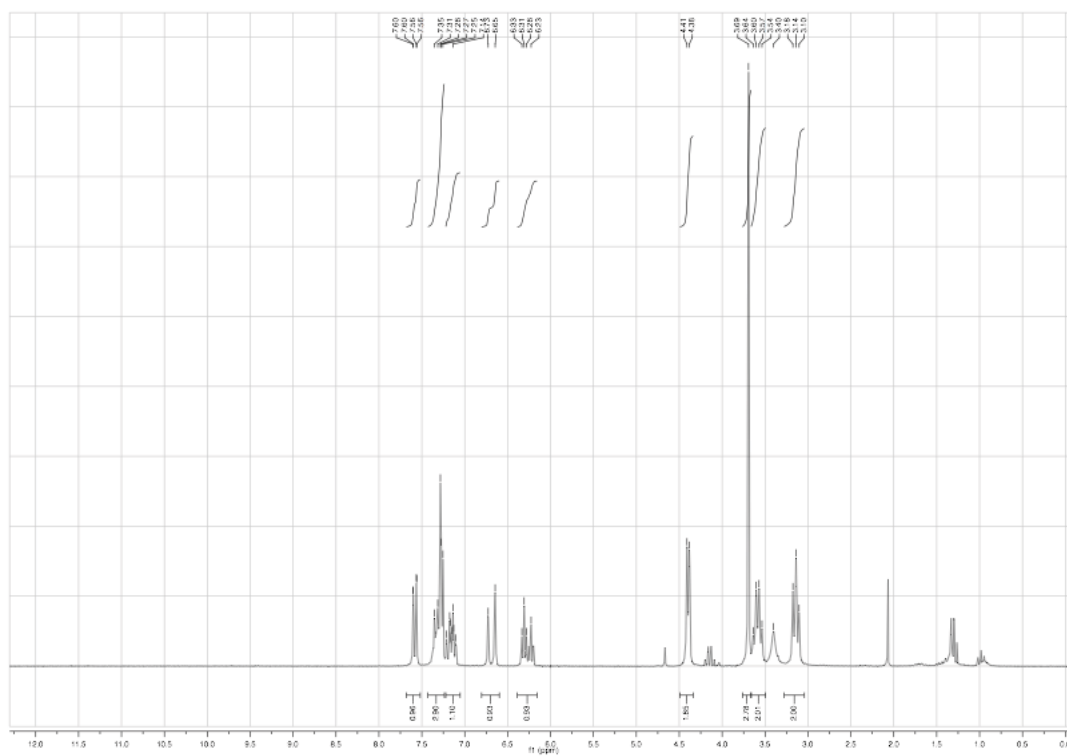




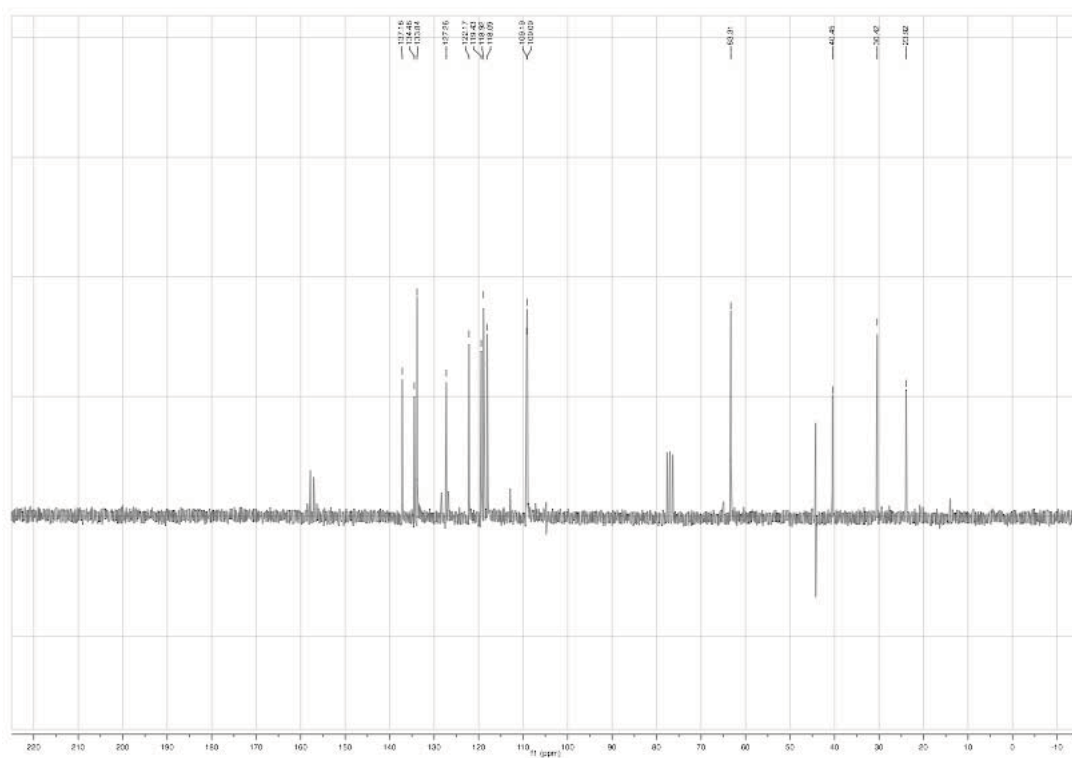


**8a**

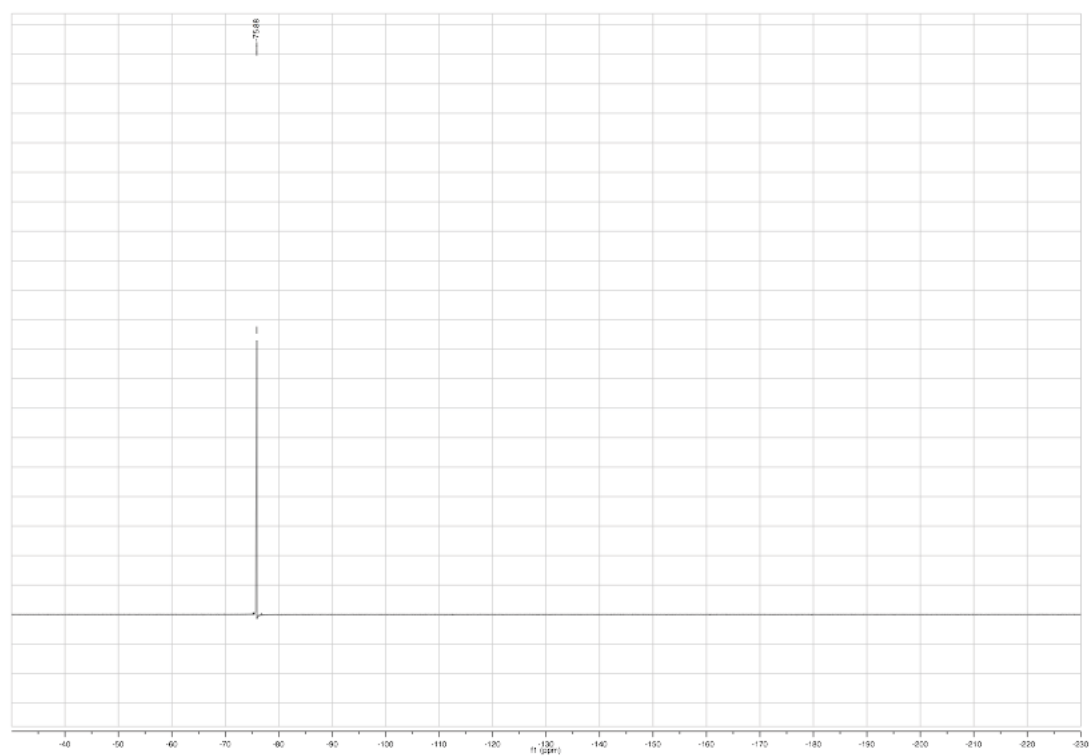
$^1\text{H}$  NMR:



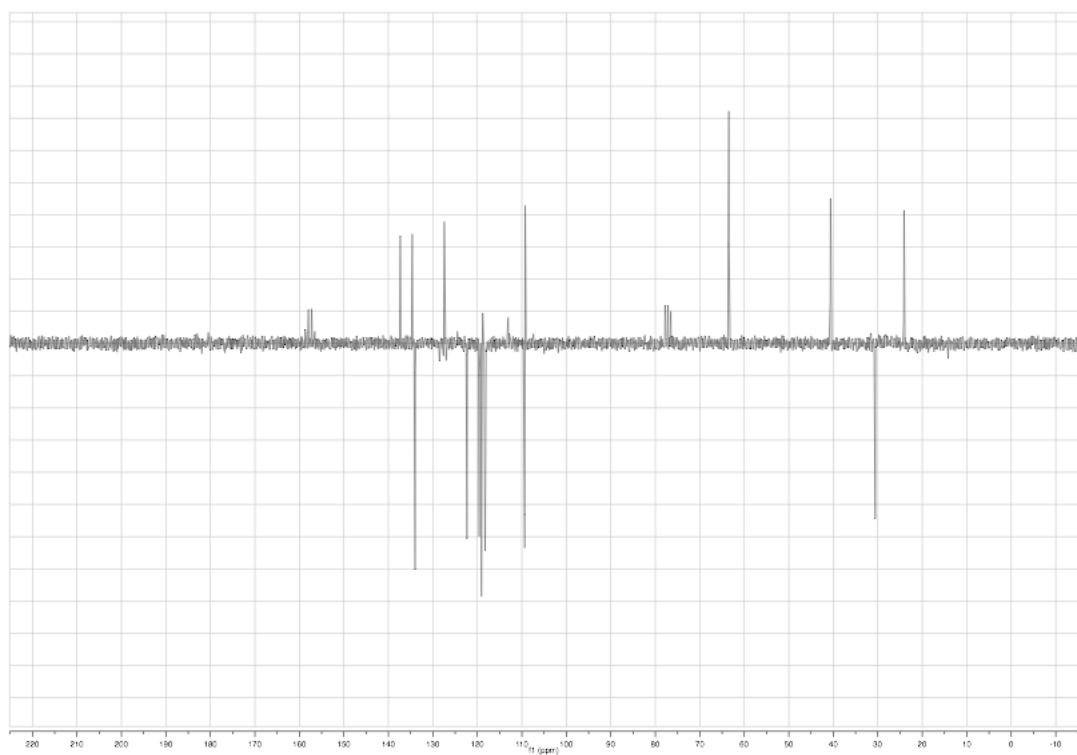
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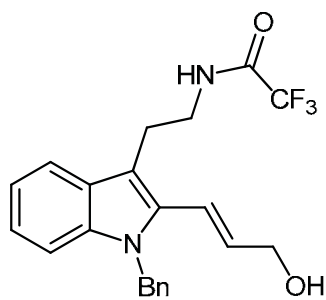


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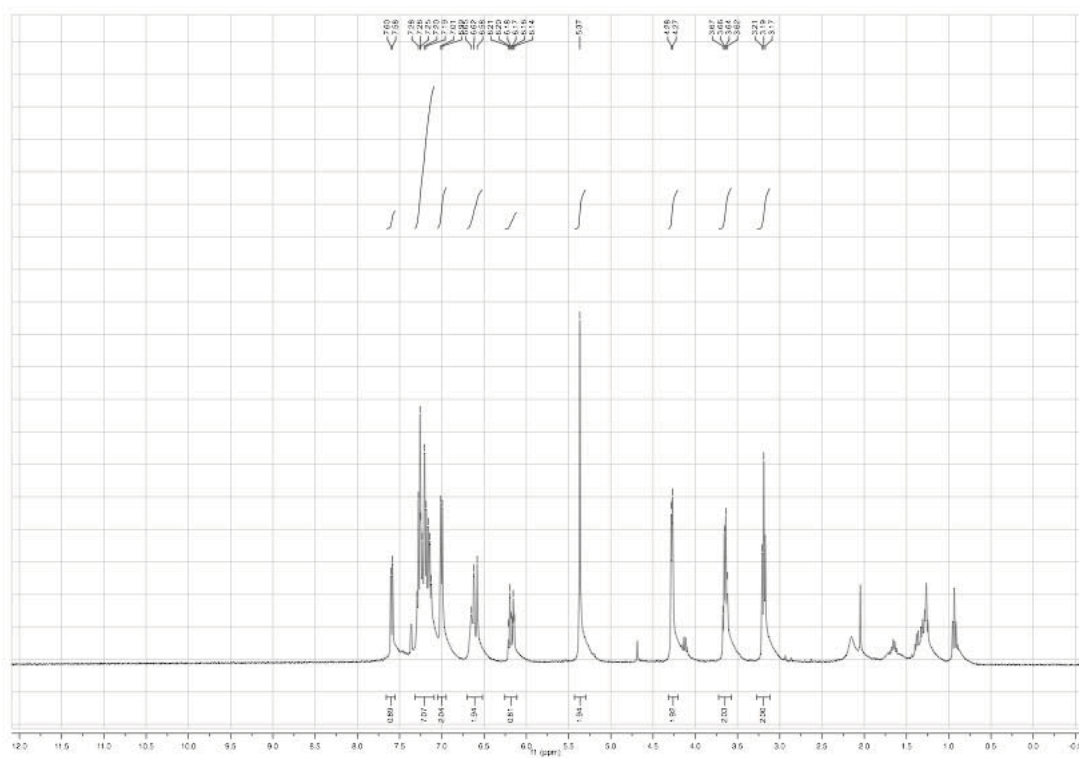
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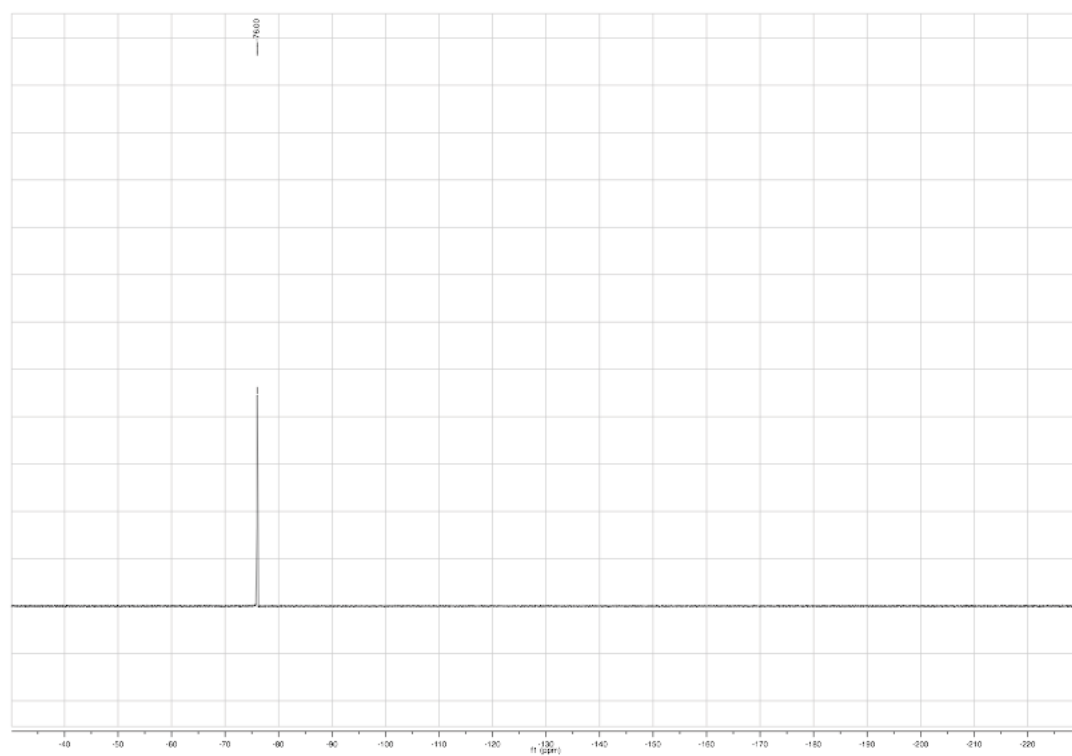


**8b**

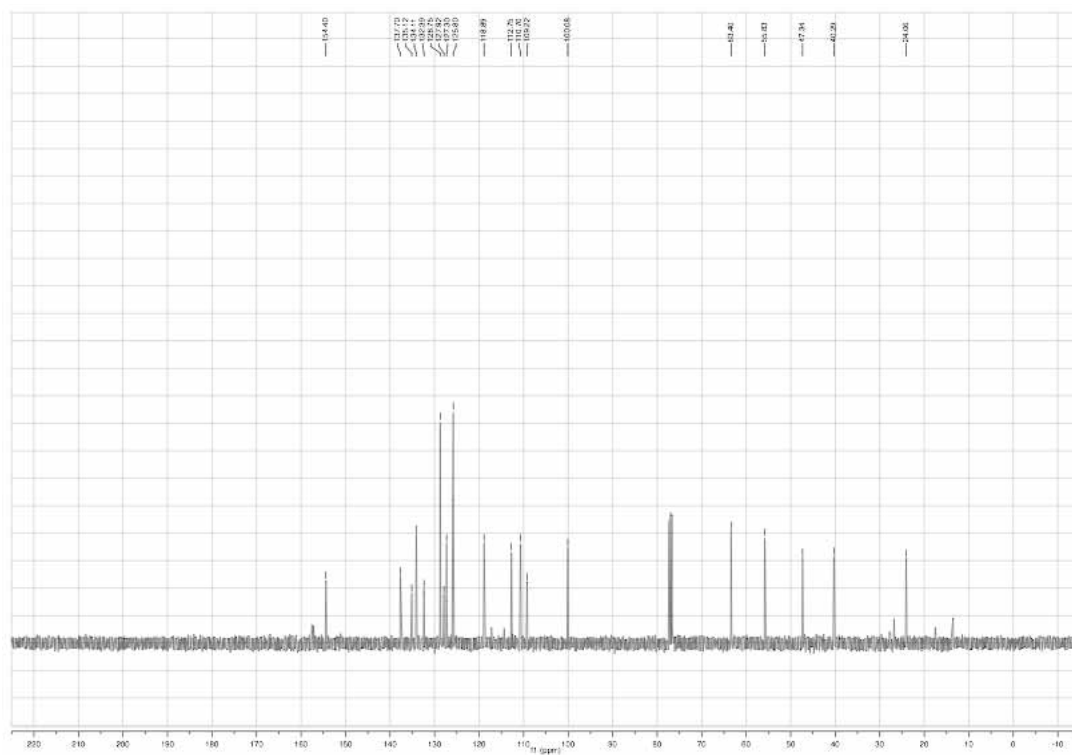
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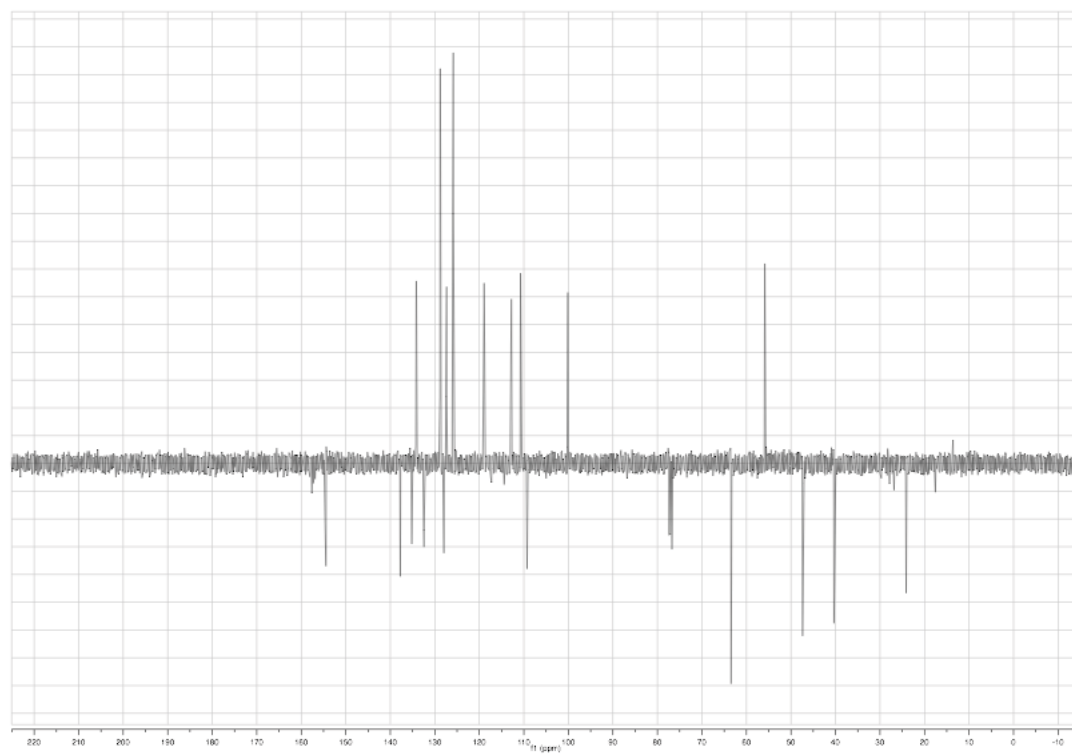
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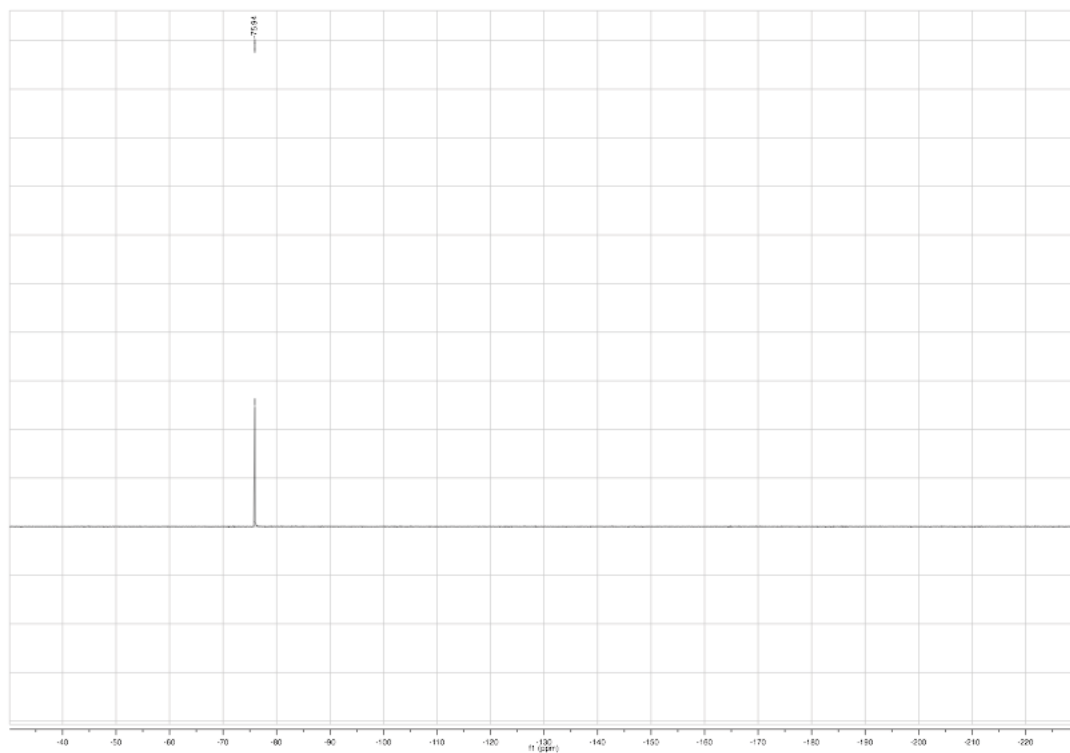
[illegible]<sup>13</sup>C NMR:



APT:



$^{19}\text{F}$  NMR:

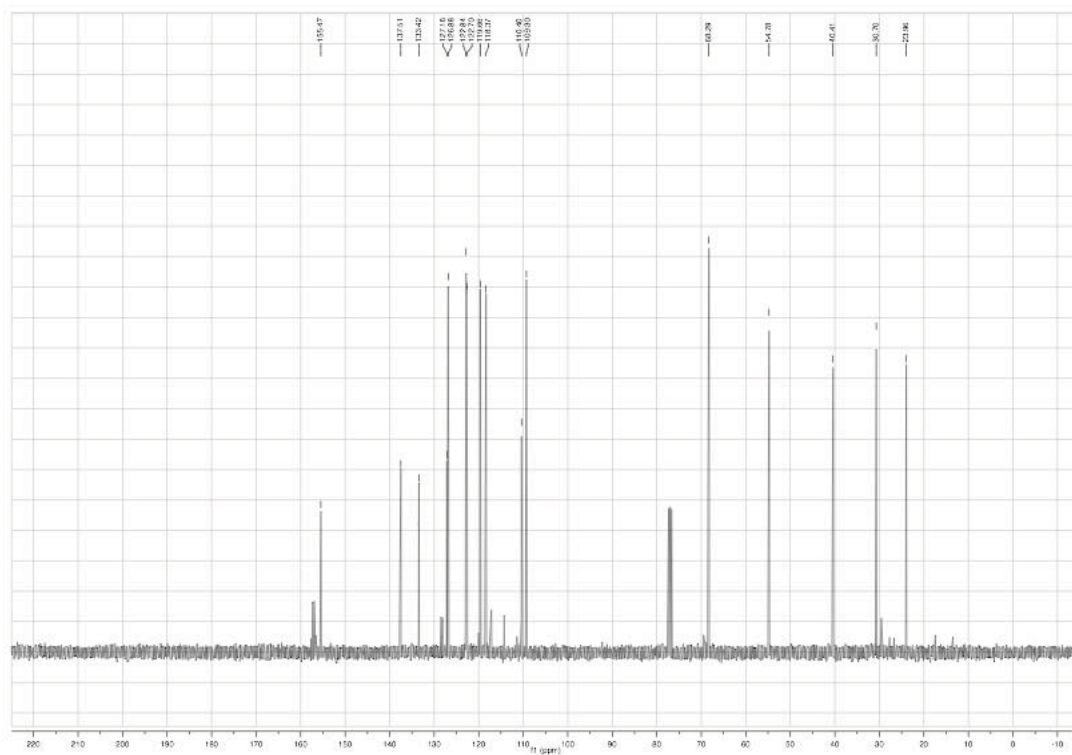




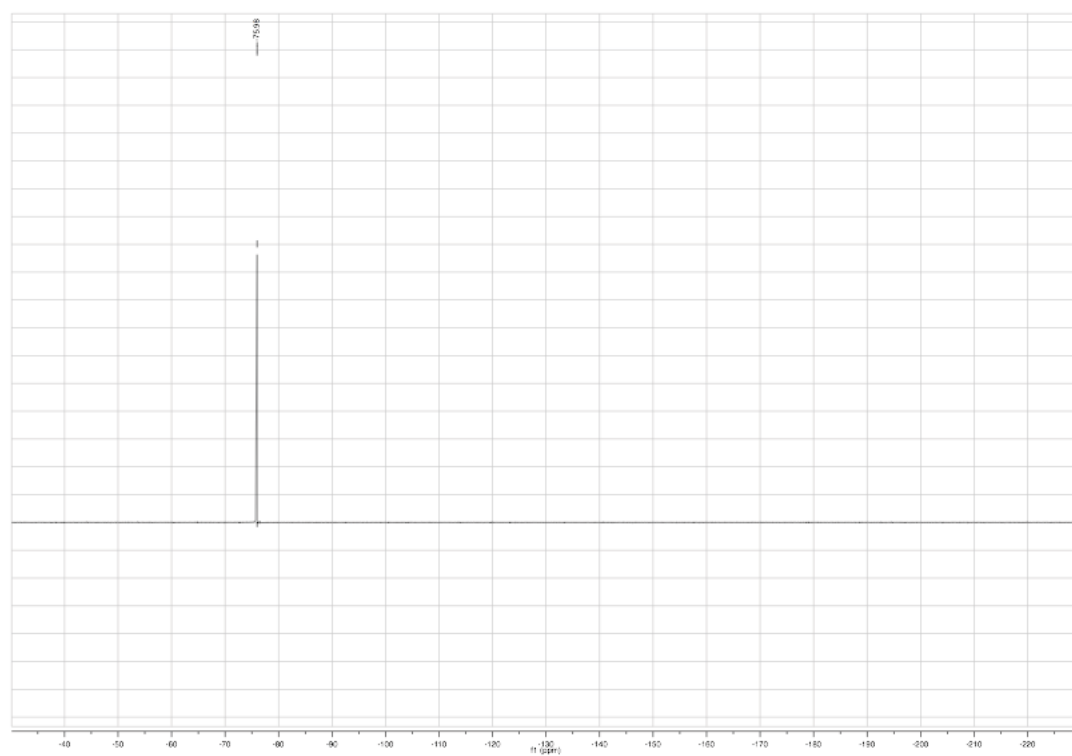


<sup>1</sup>H NMR spectrum of compound 10a in CDCl<sub>3</sub>. The spectrum shows peaks from 0 to 12 ppm. Aromatic and heterocyclic protons appear between 6.5 and 8.0 ppm. A broad singlet at ~7.2 ppm is assigned to NH. A sharp singlet at ~4.8 ppm is assigned to OH. Aliphatic protons are visible between 1.0 and 4.0 ppm. Integration values are shown below the baseline, and chemical shifts are listed above the peaks.

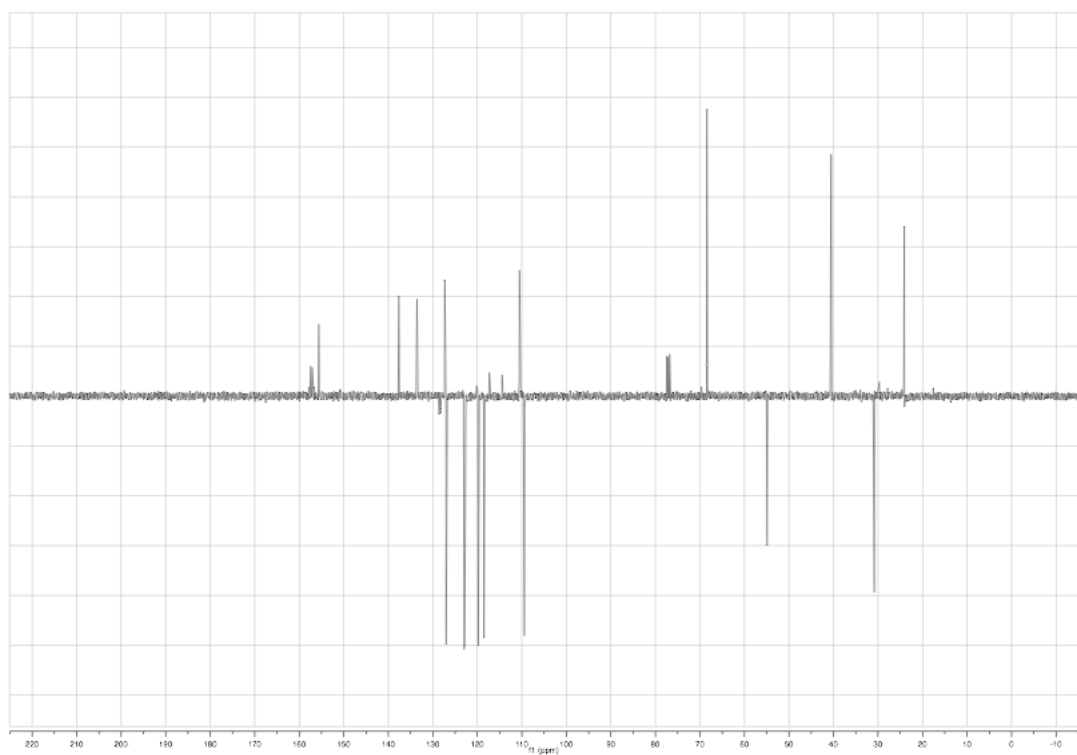
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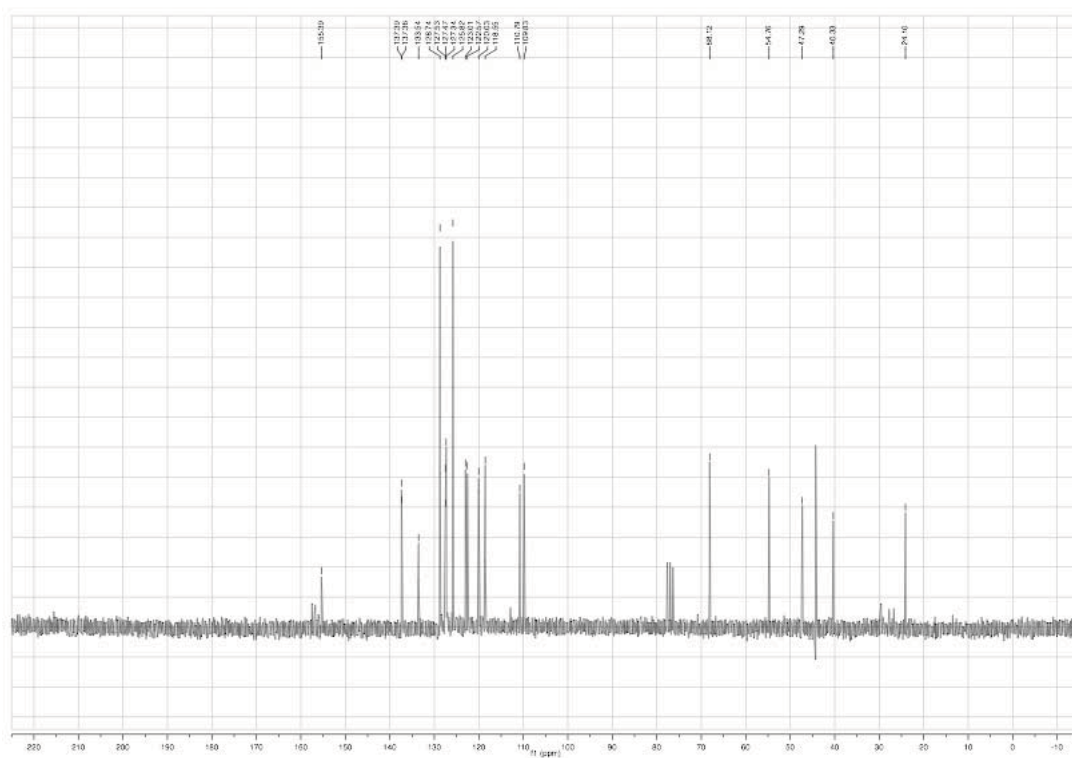
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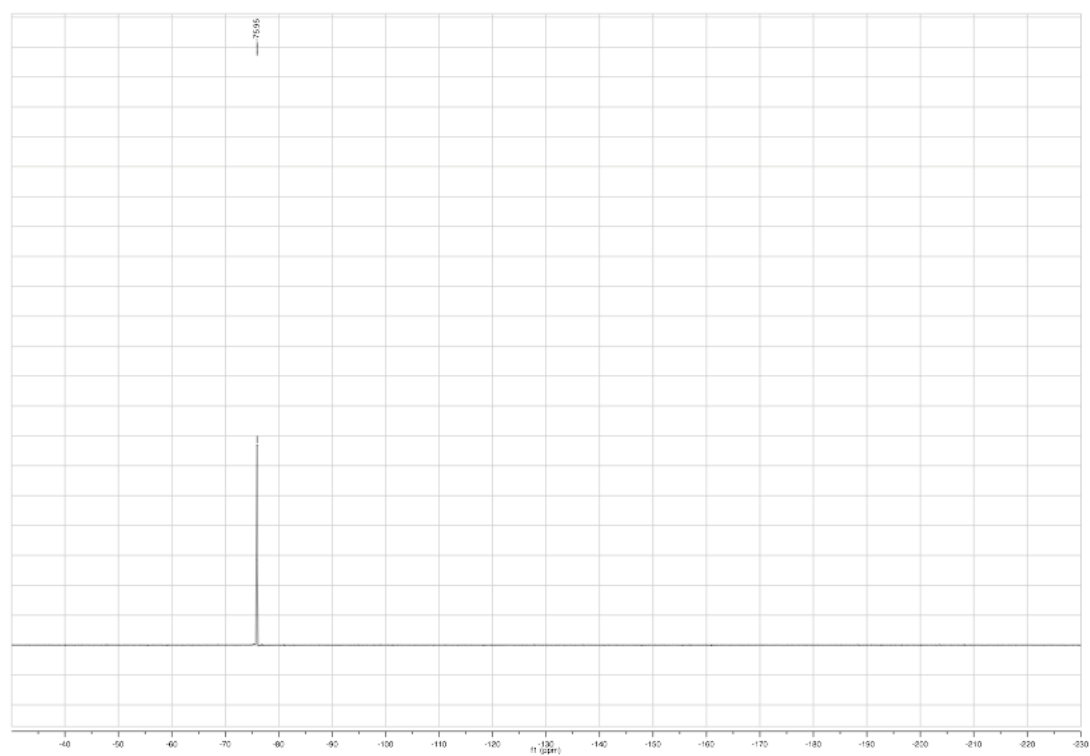
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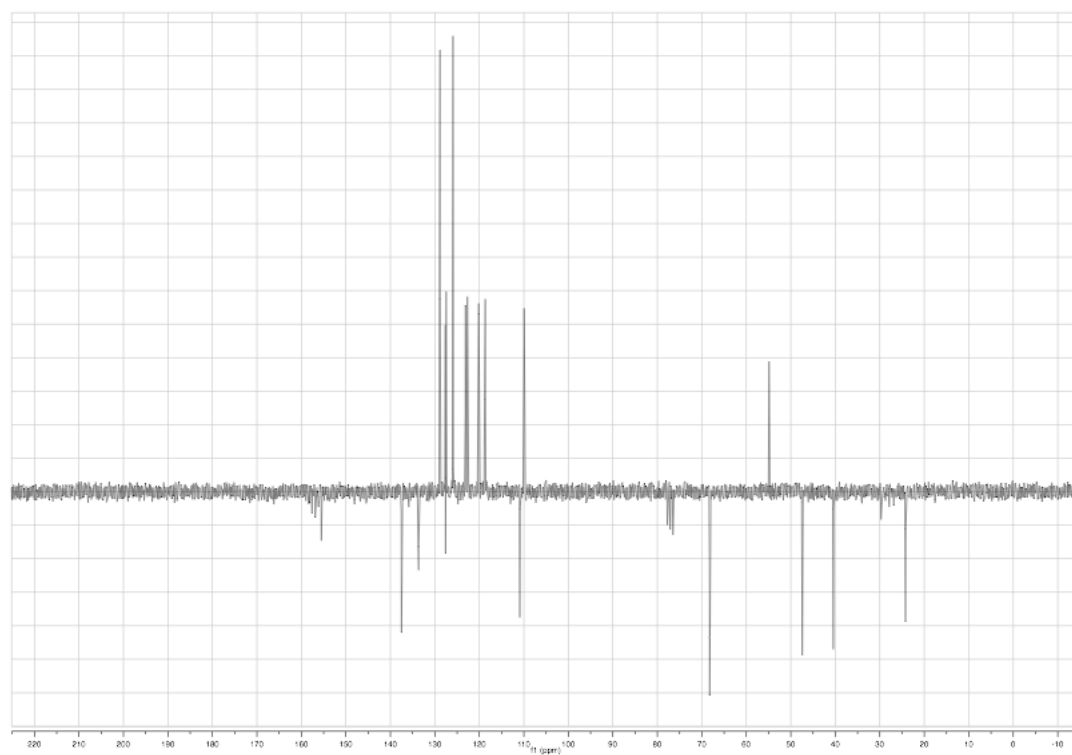
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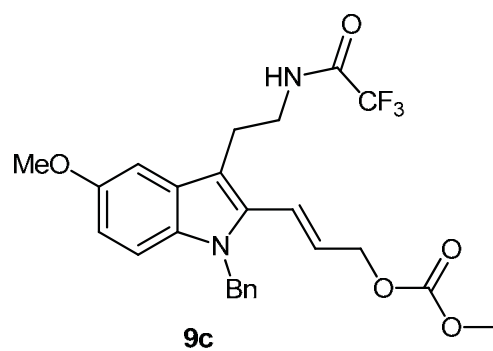


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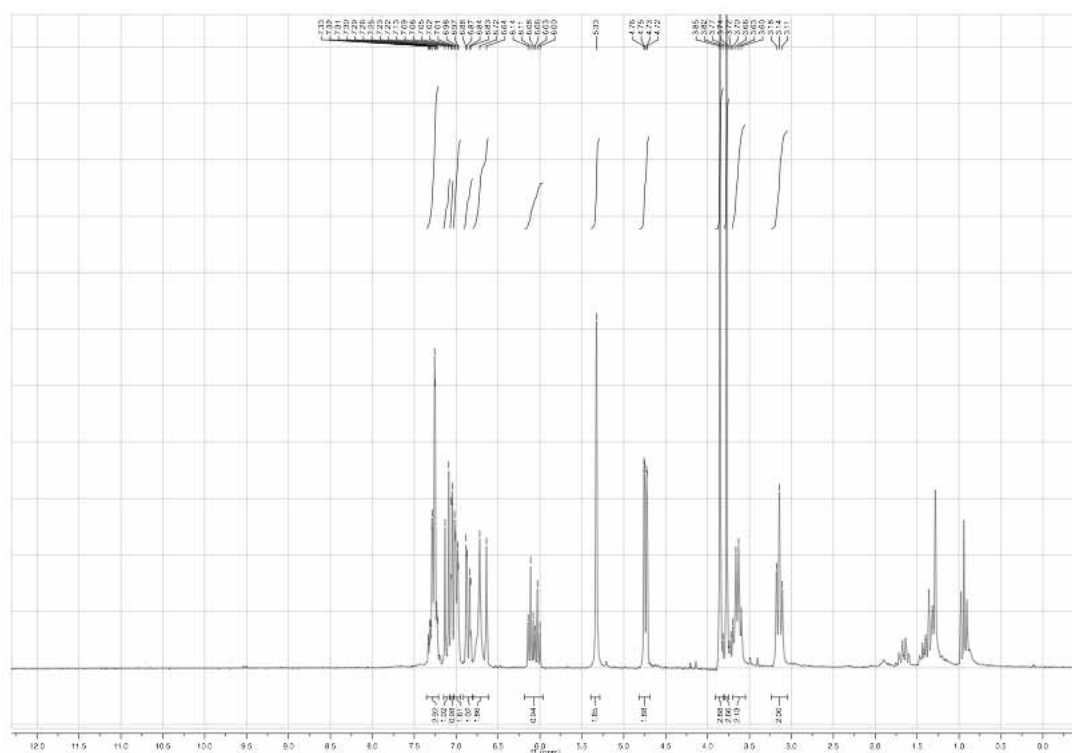


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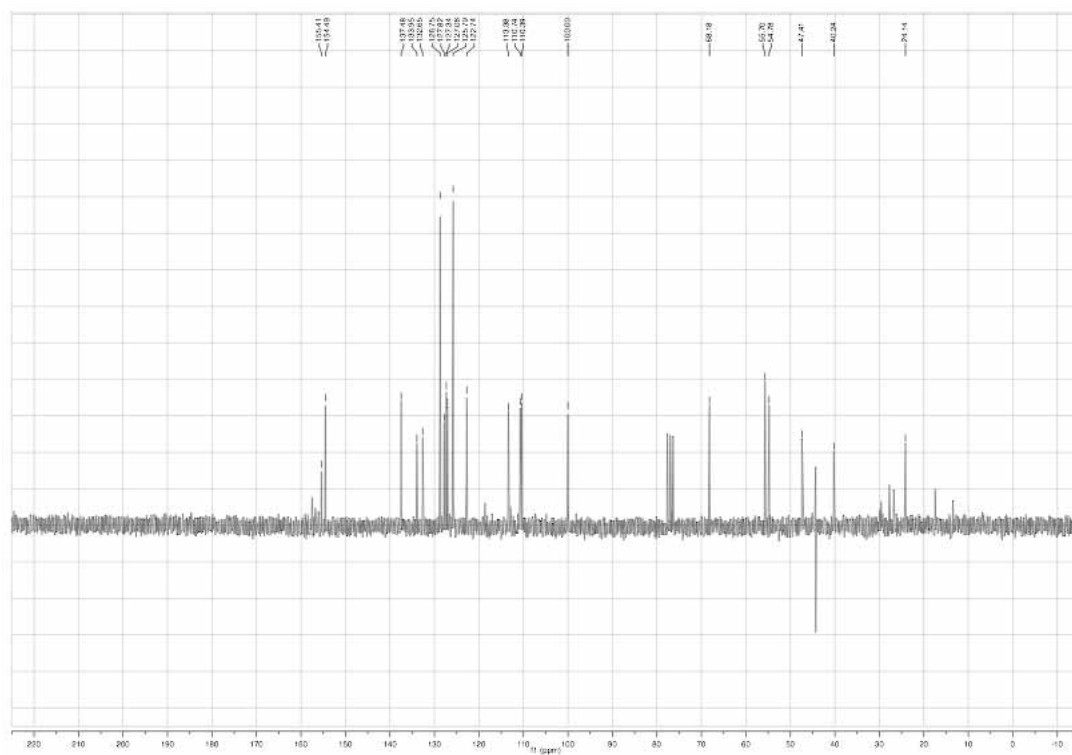




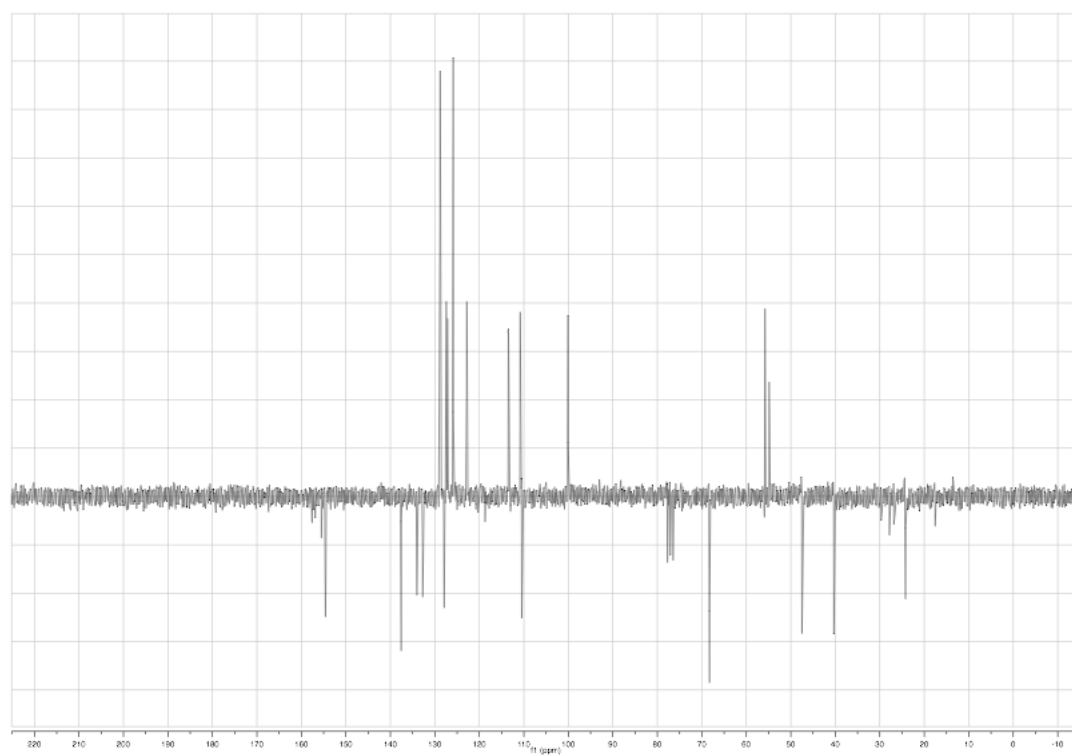
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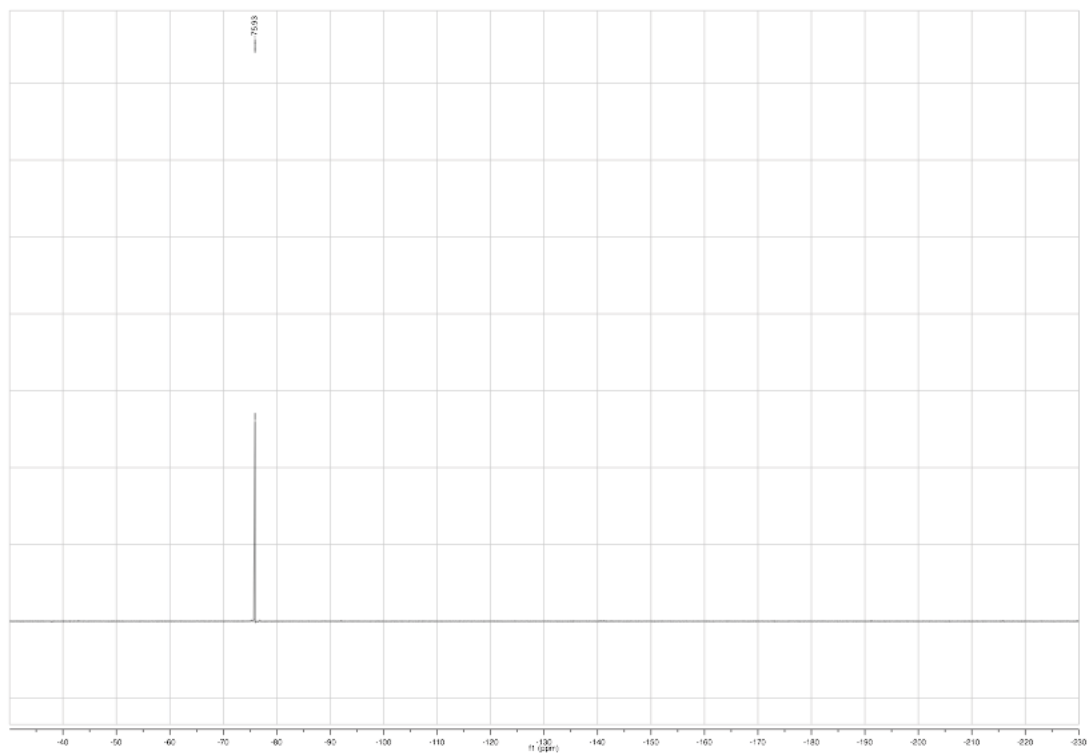


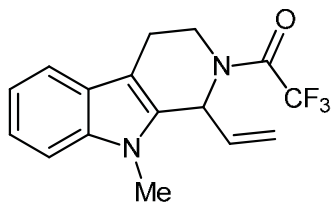
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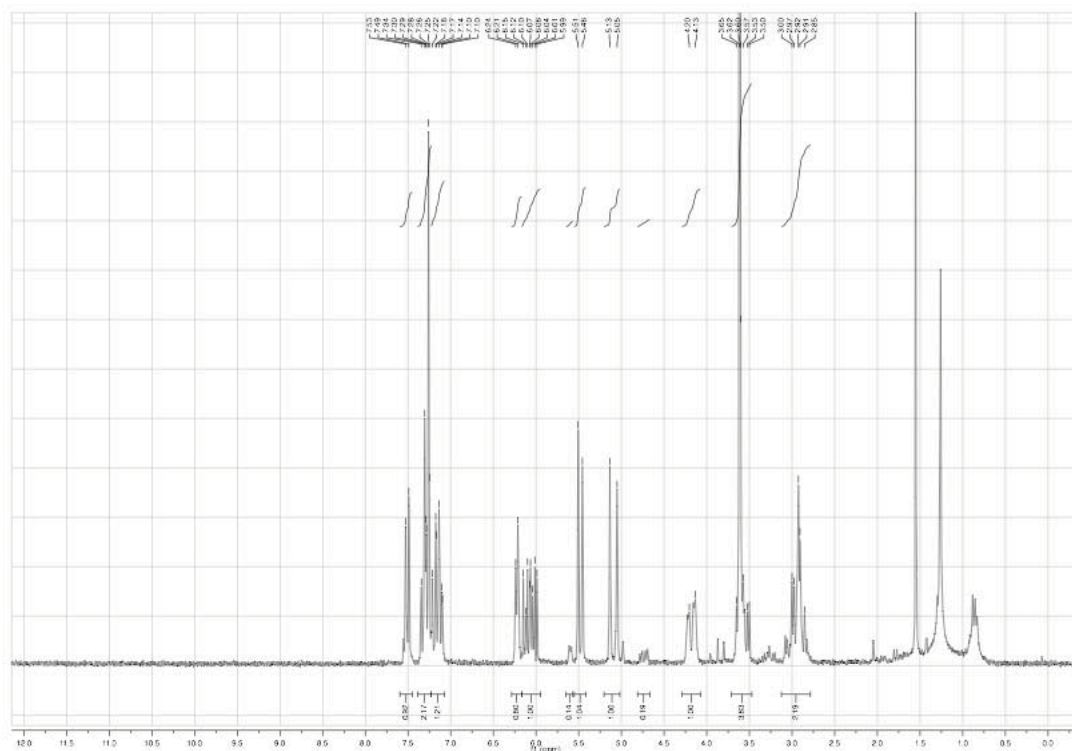




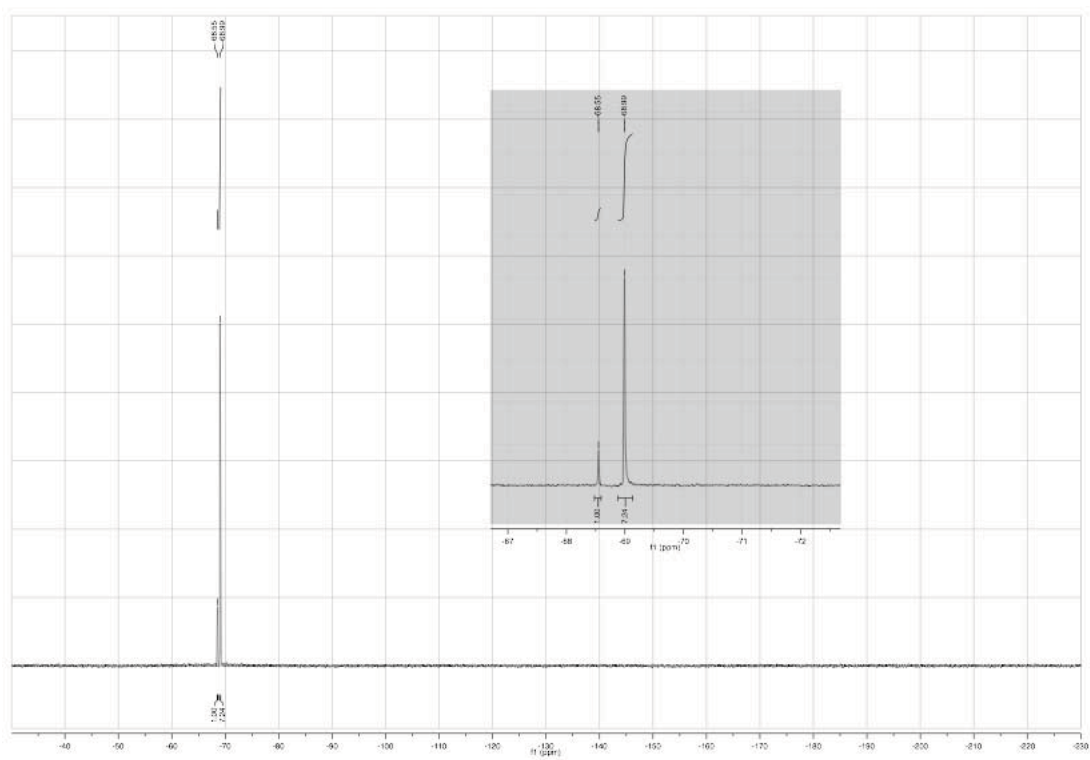


**10a**

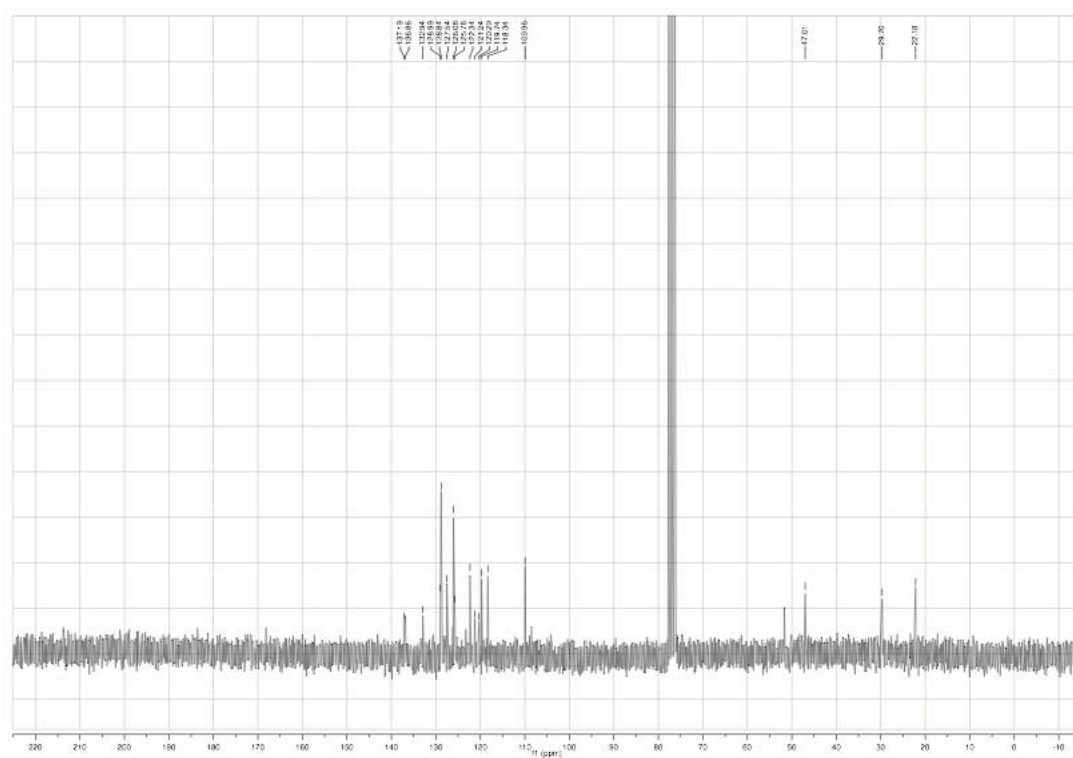
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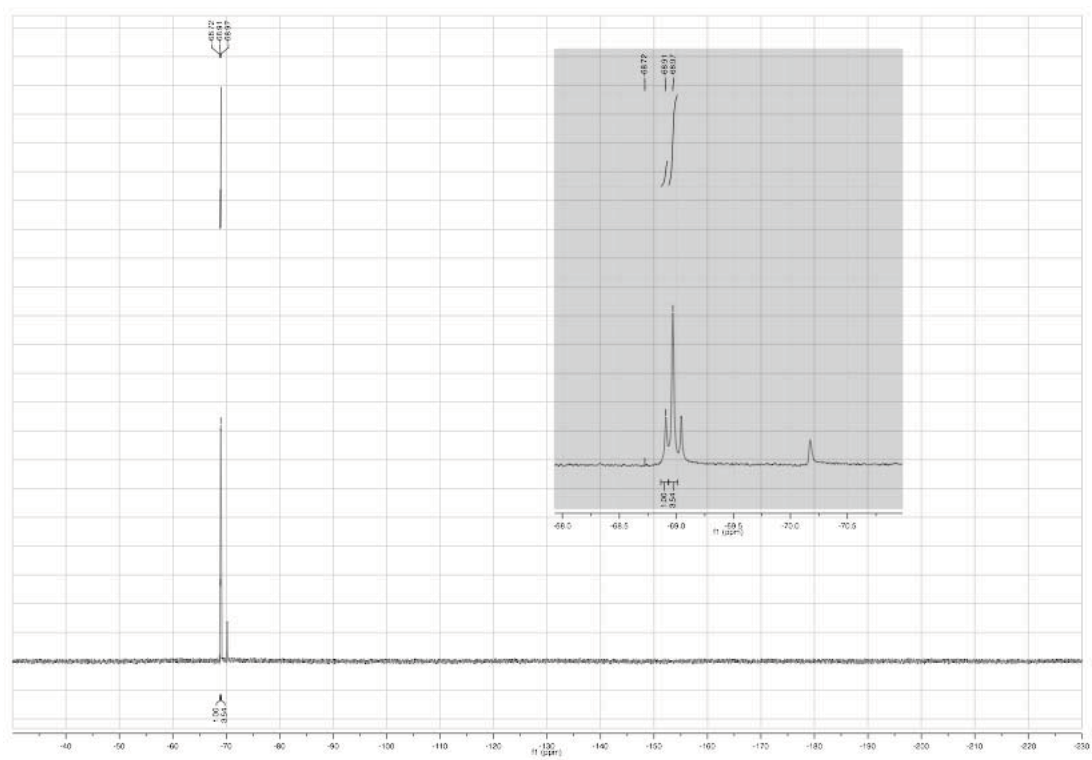
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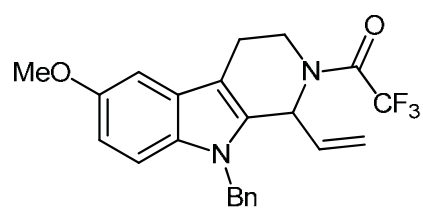


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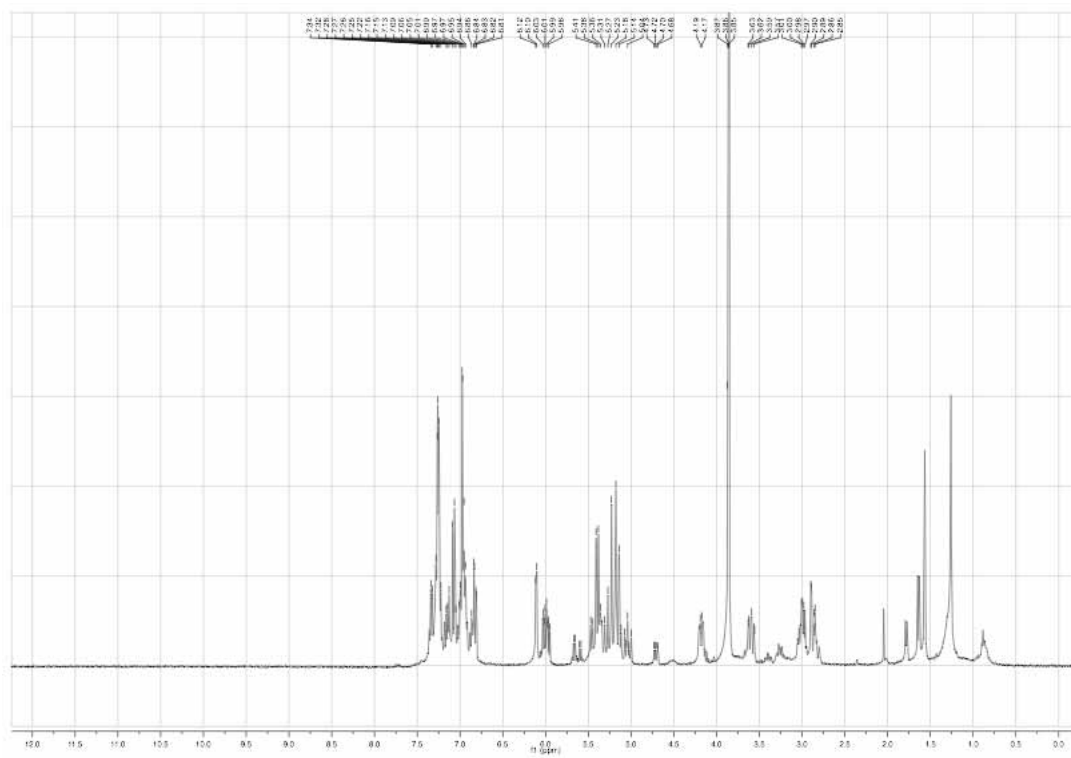
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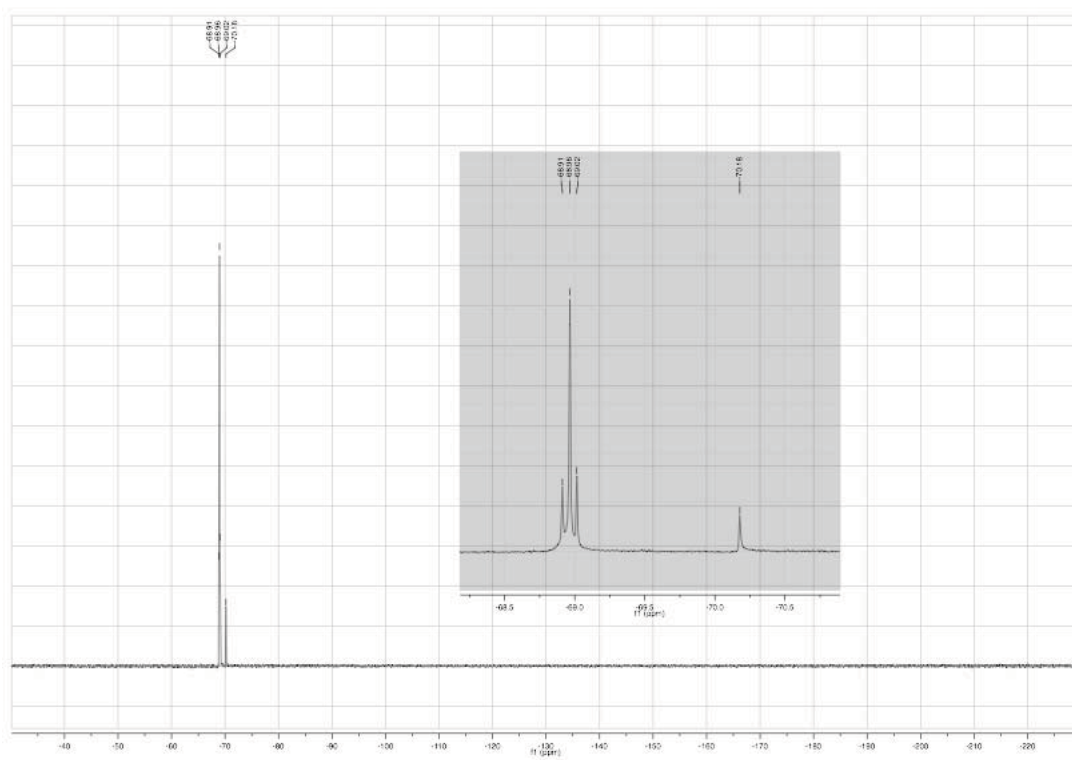


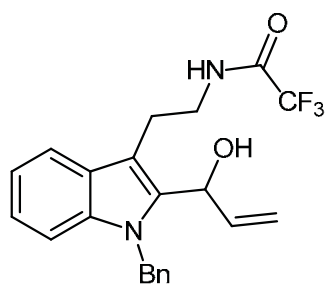
**10c**

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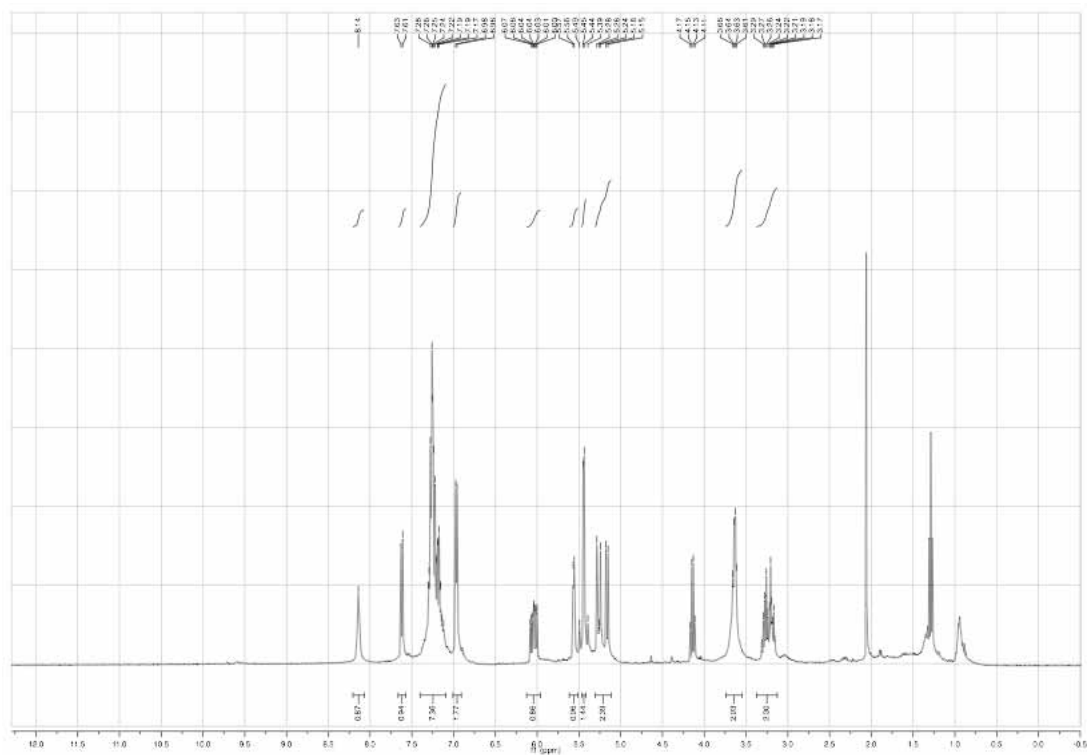
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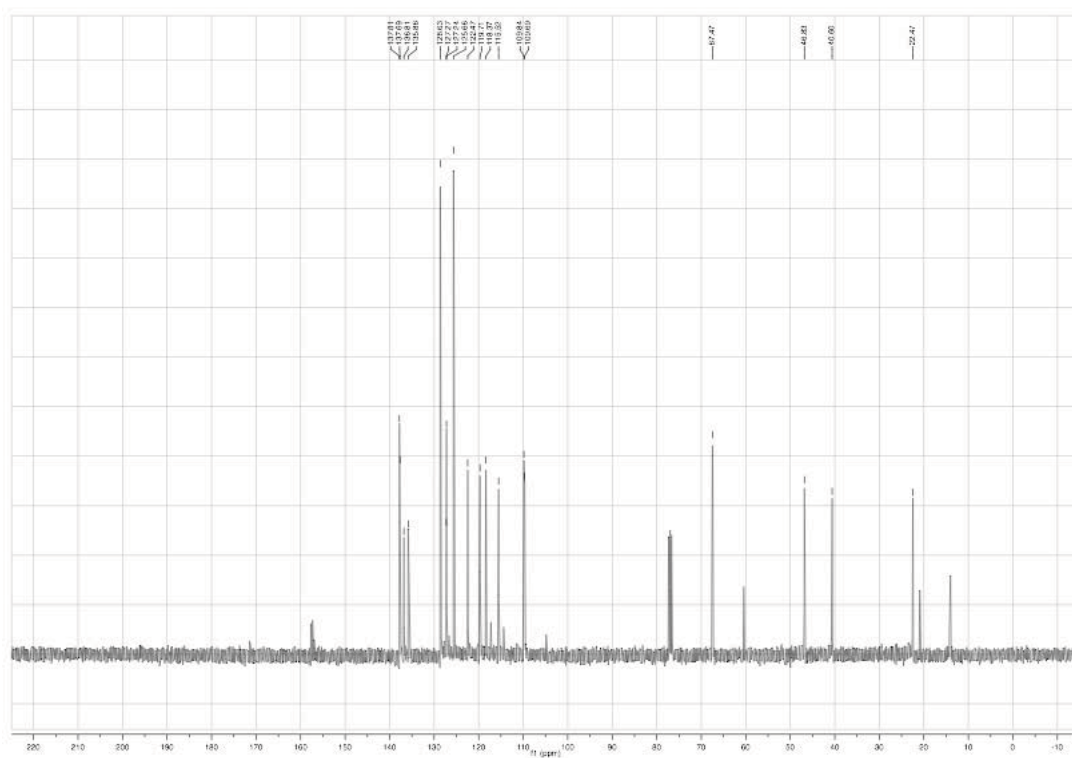
**12**

<sup>1</sup>H NMR:



<sup>13</sup>C NMR:





<sup>19</sup>F NMR:

